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JOURNAL

LONDON SCHOOL OF HYGIENE
AND TROPICAL MEDICINE.
(DEPT OF MEDICAL STATISTICS)

STATISTICAL SOCIETY

OF

LONDON.

VOL. XIX.

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ERRATA

IN DR. GUY'S PAPER "ON THE FLUCTUATION IN THE NUMBER OF BIRTHS, DEATHS, AND MARRIAGES, &c., IN THE METROPOLIS."

At page 323, line 7 from the top, *for* less than one-sixth *read* little more than 15 per cent.

Also in the Table at page 320 in the column of Mean Fluctuation opposite Ague, *for* ·23 *read* 26·40; opposite Remittent Fever, *for* ·22 *read* 22·13; opposite Infantile Fever, *for* ·20 *read* 20·00; and opposite Syphilis, *for* ·15 *read* 15·11.

The same corrections to be made in the Table at p. 327 in the column of Mean Fluctuation, lines 14, 17, 18, and 19 from bottom of page.

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LONDON SCHOOL OF HYGIENE
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(DEPT OF MEDICAL STATISTICS)

OBJECTS AND PROGRESS

OF THE

STATISTICAL SOCIETY.

The Statistical Society of London was founded on the 15th of March, 1834, in pursuance of a recommendation of the British Association for the Advancement of Science, for the purpose of collecting, arranging, and publishing facts calculated to illustrate the condition and prospects of society, and especially facts which can be stated numerically and arranged in tables. The collection of new statistical materials, it was contemplated, would form only one part of the Society's labours; the condensation, arrangement, and publication of those already existing, whether unpublished, or published only in an expensive or diffuse form, or in foreign languages, being a work of equal usefulness. It was also a prominent object of the Society to form a complete Statistical Library as rapidly as its funds would permit.

Such was the purport of the original prospectus; and now that the Society is in the *twenty-third* year of a prosperous existence, its Fellows have every reason to revert with satisfaction to this outline of its objects; for it is very seldom that the first designs of a public association for the advancement of science are all carried out with so much success as has attended upon those which that prospectus describes. The resources of the Society were, in the first instance, chiefly devoted, under the direction of its Committee, to the collection of new statistical information, and to this great purpose a part of its funds is still appropriated. Its monthly meetings have cultivated among its Fellows an active spirit of investigation, and brought out the valuable results of much individual labour. Its journal has fulfilled the purpose of condensation and publication; and the valuable books and papers which have already been collected form a library of facts of no mean utility.

The Sixth Annual Report of the Society, which contains an elaborate description of the scope and system of its labours, divides Statistics into the following chief sections:—

I. The *Statistics of Physical Geography, Division, and Appropriation;* or, geographical and proprietary Statistics.

II. The *Statistics of Production;* or, agricultural, mining, fishery, manufacturing, and commercial Statistics.

III. The *Statistics of Instruction;* or, ecclesiastical, scientific, literary, university, and school Statistics.

IV. The *Statistics of Protection;* or, constitutional, judicial, legal, military, and criminal Statistics.

V. The *Statistics of Life, Consumption, and Enjoyment;* or, of population, health, the distribution and consumption of the commodities of life, and public and private charity.

All the departments of Statistics above described may be cultivated to the development of as many branches of moral science, and to the attainment of that true insight into the actual condition of Society, without which the application of remedial measures is purely empirical.

Under this conviction, the original prospectus announced the intention of the Society carefully to exclude all "opinions" from its publications; not, assuredly, with the view of discouraging the proper use of hypothetical reasoning, but for the purpose of devoting the pages of its transactions to facts, and not to systems. In the pursuit of almost every investigation, the inquirer will adopt some hypothesis; but its truth and completeness, or its fallaciousness and insufficiency, must be demonstrated by observation and experiment. It is therefore the main purpose of scientific associations to call forth and register the results obtained by these processes; and observation in the wide field of human interest supplies those "facts calculated to illustrate the condition and prospects of society," which it is the design of the Statistical Society to "collect, arrange, and publish."

The pursuit of Statistical inquiries has already made such progress, not in England alone, but throughout Europe, as henceforth to be a necessity of the age, and one of its most honourable characteristics. Thus, errors as to the actual condition and prospects of society are daily exploded, and more just data are supplied to guide the exertions of the philanthropist, the judgment of the legislator, and the speculations of the reasoner. The labours of the Statist, indeed, can alone assure us that we are really advancing in that knowledge of human interests in the aggregate to which it is no longer possible to deny the name of Science.

The Statistical Society of London consists of an unlimited number of Fellows, admitted by ballot, without any entrance fee, but paying a subscription of two guineas per annum; of foreign Honorary Members; and of Honorary Corresponding Members, resident out of the United Kingdom; and it carefully cultivates a connexion with the several local societies of the Empire, and a correspondence with those of Foreign Countries. Fellows elected in or after the month of June are exempt from paying their subscription for the current year. The Journal of the Society, published quarterly, is distributed gratuitously to all the Fellows; its library is one of circulation; and its Rooms and its Monthly Meetings are of great resort.

Statistical Society, 12, St. James's Square,
London, March 1st, 1856.

QUARTERLY JOURNAL

OF THE

STATISTICAL SOCIETY.

MARCH, 1856.

Résumé of the Second Session of the International Statistical Congress held at Paris, September, 1855.

By Leone Levi, Esq., F.S.A., F.S.S., F.I.A., *Professor of the Principles and Practice of Commerce in King's College, London.*

[Read before the Statistical Society, 19th November, 1855.]

Amidst the manifold evidences which manifest the progress and advancement of civil society, there is none of a more solid character than the increased deference paid to the lessons of statistical science. Ignored, abused, and mistrusted as it has been, it has gradually risen in public estimation, and is now making rapid strides simultaneously with the progress of civilisation and enlightenment. "Statistics," says M. Le Play, "are to politics and to the art of governing, what anatomy is to physiology in the study of the human body;. the observation of the stars to astronomy; the study of the species of animals, plants, and minerals, to the natural history of the globe; the analysis of the body to chemistry; experimental physics to rational physic, &c. The statesman who pretends to govern without knowing the important facts which interest society, makes a more fruitless attempt than the philosopher who should propose to make a general classification of the beings which compose the three kingdoms of nature, without knowing the essential character of them."

The science of governing or of politics has fully participated in the general advancement; hence we find it seeking in the statistical element its most solid foundation. It is to this circumstance, therefore, that we must ascribe the recent movement in favour of a more systematic collection of national statistics in all countries; and it is with a view to that object that the Central Statistical Commission of Belgium took the initiative of inviting an European Statistical Congress, which was held in Brussels in September, 1853. Following so great and so successful a precedent as the Brussels Congress, the Imperial Government of France invited another International Statistical Congress, and thus a new impetus and direction has been given to statistical science.

Of the Brussels Congress I had the honour of presenting to the Society a complete résumé,* and having been deputed to the meeting

* *Quarterly Journal of the Statistical Society*, vol. xvii., part i.

at Paris by several Chambers of Commerce of the United Kingdom, I have now much pleasure in submitting a summary of its proceedings.

If the first Statistical Congress was distinguished for the number of statists and economists therein assembled, the latter was by no means less imposing on that account; and if Brussels became the birth-place of many a valued acquaintance, Paris was even more agreeable, as, besides affording an opportunity of meeting again many of our fellow-labourers in statistical science, there were others added belonging to France and other countries, names of great eminence in the world of letters, of politics, and of science.

The Paris Congress was attended by official deputies and other statists from the United Kingdom, Austria, Baden, Bavaria, Belgium, Costa Rica, Denmark, France, Frankfort, Greece, Hamburg, Hanover, Hesse, Mecklenburg, Norway, the Netherlands, Parma, Peru, Portugal, Prussia, Saxony, Sardinia, Spain, Sweden, Switzerland, Tuscany, the Two Sicilies, the United States of America, and Wurtemburg.

The Minister of Agriculture, Commerce, and Public Works of France, M. Rouher, was the President, the Baron Dupin Vice-President, and M. Legoyt, Chief of the Statistical Department of France, Secretary. The foreign Vice-Presidents were Mr. Fonblanque for England, Baron Czoernig for Austria, M. Dieterici for Prussia, M. De Hermann for Bavaria, M. Quetelet and M. Heuschling for Belgium, Dr. Bertini for Sardinia, M. Baumhauer for the Netherlands, M. F. T. Berg for Sweden, M. Schweigaard for Norway, the Councillor of State, David, for Denmark, Professor Wappæus for Hanover, Dr. Engel for Saxony, and M. Paul Siek for Wurtemburg.

Such was the constitution of the Congress which held its sittings at the *Corps Legislatif*, their great hall and adjoining rooms having been liberally granted for the use of the Congress, which continued for six days.

The object of such periodical gatherings, as it has already been said, is the establishment of a complete body of national statistics in all countries, which shall not only be complete in the items of information, and scientifically classified, but so prepared as to be comparable among themselves. This would, moreover, enable those who have to explore the various phenomena of society to extend the area of their observations over a much more expanded field, and to profit by the experience of nations. The present Congress being, so to say, a continuation of that held at Brussels, the subjects discussed must be taken in connection with those dwelt on at the former meeting; and even these form only a part of the entire body of statistical information which will illustrate the nature, characteristics, and resources of all countries.

The subjects of Territory and National Survey, Population, Emigration, Agricultural Statistics, Industrial and Commercial Statistics, Navigation, Economical Budgets, Statistics of Indigence and Pauperism, Educational and Criminal Statistics, were dealt with at Brussels. At Paris the Congress was invited to consider the Statistics of Means of Communication, Agricultural Statistics, (not completed at the first meeting at Brussels,) Penitentiary Establishments, Civil and Commercial Judicial Statistics, Provident Institutions, Statistics of Accidents, of Insanity, of Epidemics, and of Great Cities,

together with other important questions connected with Medical Science.

The Congress was divided into four sections, as follows, each of which was directed by Sub-Commissions of the Statistical Commission of Organisation.

First Section.—Nosological Table of Deaths, Statistics of Mental Alienation, Statistics of Epidemics, and Statistics of Accidents. Of this MM. Villermé, Boureuille, and Trébuchet were the Sub-Commission.

Second Section.—Statistics of Agriculture, Statistics of Ways of Communication and of Foreign Commerce. The Statistics of Agriculture formed subsequently a separate section. Sub-Commission, MM. Baron Dupin, Monny de Mornay, Wollowski, and the Comte Dubois, de Fanqueville, and Legoyt.

Third Section.—Statistics of Civil Justice, preparation of a Table of Crimes and Offences, as declared by the penal legislation of each country, and Statistics of Penitentiary Establishments. Sub-Commission, MM. Bayle, Mouillard, Arondeau, and Manceau.

Fourth Section.—Statistics of Provident Institutions and of Large Cities. Sub-Commission MM. le Vicomte Cormenin, the Baron de Watteville, and Julien.

Before entering more minutely into the subjects which engaged the attention of the Congress, we must advert to the recommendation once more put forward by it for the organisation of Statistical Commissions in all countries, as the best means for improving and systematizing National Statistics. Nothing has been done in this particular in this country since the Brussels Congress. On the contrary, the recent inquiry into the public offices, and the outcry for an ill-advised parsimony in all the branches of State machinery, give reason to fear that no extension is contemplated in the present constitution of the Statistical Department. The report of the Committee of Inquiry, recently published, on this subject, said, "We consider that the several departments of Government should collect the statistical information which is connected with their own business, and that each should publish it separately, but in a form harmonising with that adopted by the others. Thus the Finance Accounts should be published by the Treasury, the Criminal Statistics by the Home Office, the Emigration Returns by the Colonial Office; and other matters should fall to other offices, leaving to the Board of Trade the Statistics of Trade and Navigation, of Agriculture, and of Railways. The Board of Trade having had great experience and acquired much skill in the management of statistics, might also, we think, usefully be employed in communicating with the other departments for the purpose of securing uniformity of action and for suggesting improvements or additions to the published accounts."

Allowing that the Board of Trade should limit its publication to its own returns, it seems evident that, in order that the "Statistical Department" may be enabled to perform usefully the functions of advising the other departments on the construction of their statistics, its own constitution would require to be much extended. According to the recommendation of the Brussels Congress, such a department should comprise the heads of all the departments of public adminis-

tration, with the addition of some individuals eminent in statistical science, who, by their studies and special knowledge, may facilitate the practice and resolve the difficulties which belong to the science. The Baron Czoernig, the head of the Statistical Department in Austria, read a report to the Paris Congress on the subject, on behalf of the second section, in which it was clearly shown that where no separate department has been formed the statistics collected are neither profitable to the science, the domain of which is much restricted, nor to the administration itself, deprived as it is of the assistance of science. Moreover, the public administration will always experience a difficulty in collecting all its forces and knowing all its means, because it must seek them from many offices in tables drawn up according to plans altogether different, and having no relation among themselves. Such is the present state of administrative statistics in general. In the opinion of the section there is only one means to remedy the evil and to avoid the inconveniences resulting from the present method of collecting statistics, and that is the *centralisation* of the labours of all the departments. Put the statist in contact with all the branches of administration; procure him the assistance of those eminent men who have spent their whole lives in studying and developing any particular branch of the public service; surround him with the information which may be obtained from learned men as well as from persons of industry and of commerce, deeply versed, both scientifically and practically, in the secrets of their occupations, and you will have laid the foundation of true statistics, which shall help public administration, advance the science, offer unchangeable elements for international statistics, and contribute to the welfare of humanity.

The first important subject of inquiry entered into by the Congress was the statistics of ways of communication, including roads of all kinds, railways, water communication, both natural and artificial, maritime ports, light-houses, &c. Nothing could be more important as an element in civilization and social advancement than the facility with which the products of labour and thought, and the persons who labour and think, are transferred from place to place. We regret that the information respecting the extent of British roads and British canals is very imperfect. The only information given by Mr. Porter on the turnpike roads and highways of England and Wales, is of the date of 1818, at which time there appear to have existed 19,725 miles of paved streets and turnpike roads, and 95,104 miles of other public highways, or, in all, 114,829 miles. In 1829 the extent of turnpike roads was given at 20,875 miles in England and Wales, and 3,666 in Scotland. The Navigable canals are estimated to exceed 2,200 miles in length, and the navigable rivers 1,800 miles; but these numbers give but an approximation. Our railway communication now exceeds 8,000 miles in length. The French statistics give correct information on roads, dividing them into imperial, departmental, and military roads. Of imperial roads there were in France in 1854, 22,349 miles; of departmental, 28,000 miles; and of military, about 1,900 miles; making altogether 52,000 miles. To these roads we must add the railways, of which there were in France 4,240 kilometres, or 2,633 miles. In France there are, moreover,

2,930 miles of canals, and 6,000 miles of navigable rivers; or 9,000 miles in all.

Upon the Statistics of Roads generally the Congress recommended that the information should relate, 1st, to their administrative and financial organization; 2nd, to the specific conditions under which they were established; and 3rd, to the economical result of their workings.

The Paris Congress had, again, considerable discussion on Agricultural Statistics. On this subject much progress has been made, in this country, since the Brussels Congress, if not in the actual collection of them, in the settling of public opinion as to the necessity and utility of such statistics. On the questions, by whose instrumentality shall such statistics be collected? shall the agents be salaried or not? and what are the items to be collected? the Congress expressed elaborate opinions. Generally, we may say, the Congress were of opinion that the parties intrusted with the collection of Agricultural Statistics should be salaried agents, and not unpaid Commissioners. The necessity of correct maps was again enforced, and the month of May, or June, for grain, and December for cattle, were indicated as the proper times. Besides dealing with the general question, the Congress suggested other heads of information regarding the mode of tenure of land, and the laws relating to the transfer of real property, in different countries, to be included in the decennial statistics of agriculture.

Next to Agricultural Statistics attention was bestowed on the subject of Criminal and Prison Statistics, together with Civil and Commercial Judicial Statistics. Notwithstanding the early and persevering efforts of Mr. Redgrave, our Criminal Statistics have, of late, been undergoing a gradual and continued deterioration. There is now a want in them, not only of the primary heads of information, but of unity and comprehensiveness in the returns, and altogether of the data upon which to found solid principles and wise legislation. We have the statistics of the number of persons committed to assizes or sessions, but these only reveal one of the stages of transit of some of our criminal population.

Of the working of the police courts and justices of the peace we have no account; and yet there have been, of late, great changes in the law enlarging the summary jurisdiction of these inferior courts. Moreover, we have no means of ascertaining the number of crimes committed, and the proportion they bear to the number of persons apprehended.

The degree of instruction, the age, and even the sex of criminals in connection with specific offences, have of late been omitted. The publication of the English, Irish, and Scotch Criminal Tables is at dates distant from each other, and they fail to illustrate one another; whilst the publication of the Prison Reports is kept altogether distinct, instead of affording any assistance in the calculation of crime.

Of Civil and Commercial Judicial Statistics no information whatever is furnished. Our courts of justice give no account of their stewardship. We know not what is the amount of work they go through in the year, and how it is performed, nor what kind of

cases come before them and the results of their decisions. We are even ignorant of the existence of the courts of justice throughout the United Kingdom. The whole system, in short, deserves the deepest consideration; and I had the honor of submitting some observations on the subject to Mr. Fonblanque, of the Statistical Department, to the Home Office, and also to the Law Amendment Society, suggesting a plan for the organization of a complete department on Judicial Statistics. To render the criminal statistics of all countries comparable, it is requisite to have a clear and distinct idea of the crimes declared to be so by the legislation of different countries. No general classification is sufficient. Each crime must be clearly ascertained—the nomenclature must be known, and must represent an unit. In connexion with Civil Judicial Statistics, Bankruptcy Statistics were also inquired into. With respect to these, besides the description of the trade, it was recommended to show whether the bankrupt was a private trader, a society *en commandité*, a general partnership, or an anonymous or other company. Another suggestion was made in Bankruptcy Statistics, viz., to ascertain the immediate or proximate cause of bankruptcy, whether brought about by misfortune, ignorance, speculative adventures by operations beyond the range of ordinary trading, or by waste or gambling.

The subject of assimilating the Commercial Laws of different countries was seriously discussed in connexion with Bankruptcy Statistics. As it is with an act of homicide, which may be called manslaughter in one country, and assassination in another, and murder in a third; so it is with bankruptcy, which is a crime in one country, and a civil offence in another. It was decided that it would be of much utility in the interest of statistics and of international commerce, as well as for the benefit of individuals, to establish, as much as possible, uniformity in the law and usages which govern commerce, and especially in the facts and acts which are of the same nature in all countries, such as Bills of Exchange, Partnerships, Bankruptcies, &c.

Provident institutions, including savings' banks, friendly societies, and insurance companies, have, at present, a conspicuous place in public and social economy. The progress of these institutions is somewhat remarkable. The introduction of savings' banks in England, dates from the commencement of the present century. Since then, they have been extensively adopted in many countries; and, in the United Kingdom, there are now above one million of depositors and 32,000,000*l.* sterling of investment. The information necessary under such heads, relates to the number of banks, their capital and their receipts, and the cost of management; the operations of the banks as respects the public; the number of accounts opened and closed; the sum received and paid, and the amount due to the depositors; the whole in proportion to the population; besides the classification of accounts as to amount, and the classes of individuals to whom the deposits belong.

The Statistics of Accidents have always attracted considerable attention, especially in connexion with the Railway System. At a time when the industries of all countries are undergoing an immense development, and when factories are founded in all parts, it is

highly important to know, by periodical statistics, what is the relative increase of accidents. The principal classification of accidents is into those in factories and workshops; in public works and public roads, other than railways; in mines and in railways. Upon these different branches our statistical information is improving, the Board of Trade having, of late, bestowed considerable attention on the subject. The valuable papers given to the Society by Mr. Neison shew what an amount of instructive materials a proper account of accidents may furnish.

The next subject is the Statistics of Mental Alienation, calculated to resolve the questions often propounded as to the supposed increase of lunatics, and, if so, how far it may be traced to political reverses, commercial panics, speculative fever, or in general to the avidity with which riches are sought. Not less important is it to ascertain whether the nature, character, and intensity of the disease have suffered any modification, and whether owing to the progress in the methods of cure a proportionally larger number of those unfortunate exiles from human reason re-enter the bosom of their families and of society. The statistics of this subject in this country are very imperfect; the public institutions or Asylums barely representing the actual number of lunatics throughout the country.

The Statistics of Epidemics have acquired, of late, a special importance by the periodical occurrence of cholera. Epidemics, says the report, which strike uncivilized people with terror, which decimate them, and even destroy them, are, for enlightened nations in our day, the occasion of immense study, by means of statistical information. The data thus obtained from different parts of the world have not been fruitless; they have disclosed principles of practical application and of extensive bearings, and have led to the establishment of certain general principles relative to the development of epidemic diseases, and the means of diminishing their ravages. To determine the measures taken in different states to counteract or to diminish the effects of epidemic diseases; to ascertain the practical value of such measures as tested by the realized improvements; and to determine what remains yet to be done on the subject; such is the general aim of the Statistics of Epidemics. Very considerable use of statistical materials has been made by the Committee for Scientific Inquiries, in relation to the cholera epidemics of 1854, in England. These data referred to the progress and fatality of the epidemic—the estimated number of attacks—the local differences of cholera mortality—influence of density of population—influence of elevation—mortality of attacks of diarrhœa, and of cholera, in their various forms—duration of cases of cholera and diarrhœa—influence of age and sex—variations of fatality during the progress of the epidemics—and the comparison of mortality in the two epidemics in 1849 and 1854. The immense utility of closely examining the numerous facts experienced under circumstances of so trying a nature, is evident; it is by such means alone, and by watching all the relations of causes and effects, that we may hope to remove those obnoxious sources of pestilence which periodically act as a scourge upon nations.

In connexion with the Statistics of Epidemics and Population, the Congress endeavoured to lay the basis of a Nosological Table.

The Brussels Congress having decided that it was necessary to form a uniform nomenclature of the causes of death, applicable to all countries, our esteemed member Dr. Farr and Dr. Marc D'Espine, of Geneva, were desired to prepare a project of nomenclature; but, the two learned doctors having in vain attempted to come to an understanding from a distance, each of them submitted special reports on the subject. Dr. Marc D'Espine proposed to fix first the class to which each death belongs, and then to arrive at the species; and he classified the causes of death into eight divisions, each of which comprised certain categories of diseases. Dr. Farr, on the contrary, laid the greatest stress on the nomenclature of the cause of death, being sure, that if once things are known by the same name, it will be much easier to classify them; and he recommended, generally, to make use of popular names. Of course a certain classification is always necessary. As is the case with crimes, so it is with the causes of death. The word murder may have a variety of meanings in different countries, but all will agree in classing it under the head of Homicide; so with thefts or robberies, under offences against property. In the classification, also, of the causes of death, a difference existed in the method suggested by the two learned doctors. Dr. D'Espine's classification was based on the classification of the duration of diseases, which he divided into acute and chronic. Dr. Farr's classification was grounded on the well-known division of diseases into epidemic diseases, and into diseases of common occurrence (sporadic diseases), arranged in the order of the parts affected. Dr. D'Espine's classification would be useful in medical jurisprudence; Dr. Farr's has a more direct reference to sanitary science.

The Congress agreed on a nomenclature of the causes of death, and prepared a vocabulary of such causes in Latin, English, German, French, Italian, and Swedish. In the discussion on the report, it was stated by M. Dieterici, that, in Prussia, there were only 5,570 medical men in a population of 16,935,070, or 1 medical man in 3,000 inhabitants. In France there were, in 1851, 26,758 medical men and chemists in 35,783,170 inhabitants.

An elaborate and learned report of the Baron Dupin on the Statistics of Great Cities, gave rise to an animated discussion. On this subject, London exhibits, perhaps, the best illustration of the ignorance which may exist of the state of society in the very midst of us. It is but a few years since we were startled with the extraordinary revelations of the Morning Chronicle, on "Labour and the Poor." Ought the immense amount of information thus elicited to be allowed to stand out isolated, as a thing of the past, whilst London is daily augmenting its huge size, and undergoing a wonderful metamorphosis in its social elements? It is to the publication of facts in connexion with all the degrees of society, that we must alone look for the introduction of substantial improvements. In the early stages of this Society, Committees were appointed to inquire into the moral and educational state of the population, and also on the dwellings of certain districts of the metropolis. It would be highly desirable that the operations of the Society should be systematically directed, taking district after district as a subject of statistical inquiry. Thus the

Society would, in a great measure, supply what it would be impossible for Government to undertake.

The heads suggested in the Statistics of great Cities are, first the Latitude and Longitude, and Atmospheric and Meteorologic Phenomena—the area covered by houses, gardens, and streets; the number of houses, shops, and bazaars, and the number of these insured from fire; public hygiene, shewing the state of drainage, supply of water, municipal laws relating to the construction of buildings, inspection of factories, number of baths, and other similar institutions; Public Security, first as to the method of lighting the streets, the organization of police, number of garrison, and number of excisemen; the statistics of suicides, hospitals, professional men, institutes, the consumption of all kinds of food, number of markets, and special taxes, quantity of minerals and of ligneous substances consumed; industry and commerce, with information as to the individuals engaged in them, and the institutions for the protection of the same; ways of communication and transport, and the rates of fares to neighbouring places, as well as the number of post-offices and the rate of postage; municipal organization and finances, number of hospitals and of charitable institutions, organization and extent of provident institutions; statistics of crimes and of civil and commercial cases; public instruction, and the cost of obtaining it; religious professions, and number belonging to each; and public amusements, their number, and nature.

These are the principal subjects which occupied the attention of the Congress, except a brief report made on Foreign Commerce. Certain subjects were suggested to be included in the programme for the next Congress, such as a description of the financial institutions of different countries, with tables relating to the amount of taxation, and to the mode of its collection; the different sources of revenue of the state; the amount of public property; number of establishments of credit, division of expenditure and public moneys in general, as well as the annual amount of the provincial and public debt, and sinking fund. A desire was also expressed that the programme of the next Congress should comprise the establishments for public instruction, and the statistics of articles of food. The subject of Economic Statistics, which was proposed at the Brussels Congress, has been followed up, in Belgium, by an important inquiry instituted by the minister of the interior, on the suggestion of the Central Commission. The results of this inquiry have been collected by M. Ducpetiaux, while some such economical researches have also been made in other countries. A work of very considerable extent on the occupation, the domestic life, and moral condition of the working populations of Europe, by M. Le Play, has also appeared. It is an atlas of social science.

The want of assimilating the Moneys, Weights and Measures of different countries, became again the subject of discussion. A vote was accordingly passed, to the effect that the Congress considering how much the adoption, by all nations, of a uniform system of Weights, Measures, and Moneys, would facilitate the comparative study of the statistics of different countries, expressed a hope that such a uniform system would be put in force. In connexion with

this subject, a proposal was made by a member of Congress, that one common language should be used in all future meetings of the Congress, and that such language should be the French, because it is the most general in Europe, and is the language used in diplomacy. It was, however, considered desirable to leave to the Commission, which shall prepare the programme of the future Congress, to fix the language to be used. It was also decided that the French Commission should be charged to determine the place and the time for the holding of the third session of the International Statistical Congress. The Members of the Congress were honored with a reception by the Emperor, at the Palace of the Tuileries, and also by the Minister of Commerce and Public Works. A dinner of all the Members, presided over by the same Minister, closed the transactions of this great statistical gathering.

It seems scarcely necessary to point out to this Society the immense utility and influence of such International Statistical Congresses; especially when we consider that the purpose of the Society is not to establish theories and support them by facts, but primarily to collect, arrange, and publish facts, calculated to illustrate the condition and prospects of Society. Already considerable impulse has been given to statistics by such periodical Congresses; nor have we ourselves failed to derive some substantial results. The proceedings of the Brussels Congress with respect to the scale for the Ordnance Survey, were decidedly useful. The report of Dr. Farr, on the subject, with the recommendations of the Congress, which were also approved by the Council of this Society, contributed largely to the attainment of a general agreement on the subject. The collection of Agricultural Statistics ceased to be considered a mere theoretical desideratum; and in many other subjects we might trace a great and solid advance. It is to be regretted that the attendance of statists from England has hitherto fallen much short of what would be required to represent, with becoming weight, the vast interests of the British Empire. This fact, however, affords only another illustration of the slowness with which new movements find their entrance into British soil, whilst at the same time they are certain, eventually, when beneficial, to obtain a spontaneous and hearty acceptance. The Belgian and French Governments have been the first to bestow their patronage on such International Congresses. Let us hope that the British Government may also be induced to take a similar course, inviting the Congress to hold its third session in London, and that with the active co-operation of this Society, we may, in 1857, return the kindness and hospitalities which have been twice liberally bestowed on us.

The entire scope of statistical enquiry was briefly, but lucidly and comprehensively, detailed in the introductory address of the Minister of Commerce; with some extracts from which I shall conclude the present résumé. "Whether statistics prove the development of population, its increase, or its decrease, its riches, or its misery, or whether it registers the elements of production, and of consumption, among nations, it tends always, and that is its chief merit, to discover and develope all the general laws which may assist to render men better and happier. Yes, Gentlemen, such is your

mission. It belongs to you to prove, by attentive researches, what is the system best adapted to the state of Agriculture in each country; how insufficient products may be supplied, and how abundant products are to be distributed; to tell us how to develope more and more universal industry, to improve weak nations, without injuring those more advanced; to second national industries, sometimes by protection, at other times by liberty; and to facilitate, by the best means of communication, both labour and exchanges.

"After having learnt how nations are enriched, you tell us up to what point it is possible to prevent misery by means of provident institutions, or by the assistance of individual and public charity. If, in the difficult study of the morality of nations, certain facts remain concealed within the bosom of the family, and certain causes of depravity remain buried within the mystery of the soul, and if numerous social elements escape analysis, you may, by a learned comparison between the penal laws, judicial institutions, and means of repression, prove which are the best means to restrain evil propensities, to extinguish crime, to intimidate, to punish, and also to correct criminals, to prevent their return to crime, to augment social security, and to diminish, lastly, that terrible impost which each nation pays, with an astonishing regularity, to the prison, the jail, and the scaffold.

"You may, above all, search out what are the institutions and laws, which after the good examples and solemn teaching of religion, without which nothing is valid, contribute most powerfully to moderate the passions, to develope the love of family, and of country, and to improve and reform the heart. That we may obtain the lessons of facts collected from the whole world; that we may generalize observations, and render them conclusive, it will be necessary to go through many and long labours; it will be necessary to associate the most patient investigations of the most intelligent minds. Comparative Statistics cannot content themselves with partial and uncertain observations; they must always repose on reality, and always submit to the law of great numbers. It is on such a condition only, that it can afford to social science a kind of mathematical certainty, and give a considerable assistance both to nations and to governments. To accomplish a task so vast, neither one congress nor one generation is sufficient. But in the path you have opened and traced, however small the portion of good you may accomplish, you will draw forth new encouragement, and new energies. Labourers will never be wanting in this work, because it has for its moving power a sentiment as eternal as the love of God, and the love of humanity."

N.B.—The Author proposes to prepare a detailed account of the recommendations of the Congress, as soon as the official report shall make its appearance.

On the Nature and Extent of the Benefits conferred by Hospitals on the Working Classes and the Poor. By WILLIAM A. GUY, M.B., Cantab., *Physician to King's College Hospital, and one of the Honorary Secretaries of the Statistical Society.*

[Read before the Statistical Society, 17th December, 1855.]

THE benefits conferred upon society by hospitals are very generally understood and appreciated. They are known as places of resort for the poor in sickness, and as places for their reception in more severe accidents and diseases; as practical schools of medicine and surgery, where skill and experience are acquired, to be afterwards employed in the service both of rich and poor; as centres from which other charities often take their origin; and also as institutions within which religious services are performed with frequency and regularity, and religious counsel and consolation afforded at a time, and under circumstances, when they are most needed and most acceptable. It is also very generally understood that hospitals belong to the class of charities least open to abuse, inasmuch as the want against which they make provision is measured and tested not only by the assertions of the applicant, but also by the experience of those who dispense their benefits.

All institutions professing to relieve distresses which can be known only through the statements of those who make application to them, are subject to be abused to an extent which must always suggest grave doubts of the expediency of maintaining them. But, happily, no such misgivings exist in the case of hospitals, especially in the case of such hospitals as are both charities for the relief of the sick poor and places of instruction and experience for the younger members of the medical profession.

In this estimate of the services which hospitals render to society, it is probable that all who have any knowledge of the subject will be agreed; but there are one or two points upon which our information is at present so scanty and imperfect as to admit of very great difference of opinion, even among persons practically conversant with the management of hospitals. There are two questions especially to which I am not aware that any answer has yet been given; nor has any collection of facts been made with a view to furnish a reply. The first question refers to the class of persons who resort to hospitals; the second to the proportion which that class forms of the population to which they belong. Many persons, if they were asked to what class of the community the applicants for relief belong, would probably answer, without hesitation, to the poor and destitute. They have heard, perhaps, that persons in good circumstances are sometimes guilty of the great meanness of disguising themselves that they may pass muster with the poor; and that others who can well afford to pay for medical advice, present themselves without shame, hesitation, or disguise, as if their right to be received as patients admitted of no dispute. But they look upon these cases as rare exceptions to a general rule, and do not dream of a large and, probably increasing class of working men, in the receipt of good

wages, who are in the habit of applying to hospitals as a matter of course, even for trifling attacks of illness, to say nothing of those which sometimes follow immediately on expensive acts of self-indulgence. Of the proportion which working men so circumstanced bear to the poor properly so called, and of the ratio which the two classes collectively bear to the entire population, they have no correct idea; nor are they in possession of any facts bearing directly upon the solution of these very interesting questions. The facts contained in this communication will, it is hoped, go far to supply our present want of information upon both questions.

It is to be regretted that the records of our hospitals and dispensaries are not kept with sufficient accuracy, or on one uniform plan, so as to admit of a complete account being given of the number of persons availing themselves of charitable aid in these institutions, year by year, in the whole of London. It is also, perhaps, to be regretted, that a uniform system for the admission of patients has not yet been adopted, especially in the case of out-patients, who form the great majority of patients at all our hospitals. The difference known to exist in the mode of admitting and registering out-patients is fatal to any attempt to obtain a true return of the number of persons relieved. In some hospitals letters of recommendation are required, in others not; in some hospitals there is a daily attendance, in others attendance is given only once, twice, or three times a week; in some hospitals one letter serves for the whole attendance of each patient, in other hospitals the letters are renewed every month, once in two months, or once in three months, each letter bearing its own distinctive number. The rules for the admission of in-patients vary less in the different hospitals, but the difference is probably sufficient to impair the value of any general abstract which might be attempted.

The different usages prevailing in the several hospitals of London with respect to the attendance and registration of patients, to which I have thus drawn the attention of the Society, raising, as they do, an insuperable difficulty in the way of a satisfactory general return for the whole of the metropolis, impose upon us the necessity, if we would obtain any information at all upon this very interesting and important topic, of resorting to the records of some particular hospital.

Now it happens that King's College Hospital, with which I have the honour to be connected, has, from its first establishment to the present time, kept a faithful record of its patients, in a form and upon a principle which render it peculiarly applicable to such an inquiry as the present. Every in-patient and every out-patient is entered on the books of the hospital once only for each accident or illness, while each minor casualty requiring a single attendance or short treatment by the resident medical officers, is registered by the porter. In making use of these facts for the annual report, the patients are carefully abstracted in parishes and districts, and the casualties registered by the porter, not being entered with the residence and parish, are distributed among the parishes and districts in proportions which are believed to be fair approximations to the true numbers. The parishes of St. Clement and St. Giles, which, besides

being close to the hospital, supply large numbers of out-patients, were credited in 1854 each with 1,000 casualties, St. Andrew and St. Martin each with 500, St. Mary-le-Strand, St. Paul Covent Garden, and St. George Bloomsbury, St. Dunstan, and St. Anne Soho, with 100 each; the Liberty of the Rolls with 50; and St. Pancras and St. Bride each with 25. The numbers in the annual abstracts, therefore, represent the true number of patients relieved every year; or, if the return departs in any degree from the truth it is on the side of omission, and certainly not of exaggeration.* It may also be proper to mention that during the fourteen years that the hospital has been in existence, the medical staff has hardly undergone any change, so that the registration of patients has been effected with the same care and on the same principle throughout.

Taking for granted, as I feel that I am justified in doing, the accuracy of the returns of patients treated at the hospital, it is still necessary that I should give such an account of the district in which the hospital is situate; of charities of the same kind existing in its neighbourhood; and of its arrangements for the seeing of patients; as may give their true value to the facts presently to be brought forward.

King's College Hospital, formerly the workhouse of the parish of St. Clement Danes, was fitted up for the reception of patients in the year 1839, and opened in the spring of the year 1840, the first patient having been entered on the books April 15th, 1840. The first year of the returns is, therefore, a broken year. When the hospital was first opened, and until the year 1850, a dispensary, known as the Metropolitan Free Hospital, stood within a few doors of it. This has since been removed to Devonshire Street, Bishopsgate. Another similar institution, the Public Dispensary, removed to Carey Street in the year 1850, was also within a short distance of it. The removal of the first-named institution accounts for a part of the great increase of patients which took place at King's College Hospital in the years 1850 and 1851; an increase so considerable as to have led in the two following years to some attempts on the part of the Committee of Management to limit the number of out-patients. The plan adopted consisted in requiring all out-patients to bring governors' or subscribers' letters of recommendation; but this was soon abandoned, on account of the great inconvenience which it entailed upon supporters of the charity living within a short distance of the hospital. The adoption, for a time, of this plan, accounts for some falling off in the number of patients in the years 1852 and 1853.

The hospital stands at the angle formed by Portugal Street and Carey Street, Lincoln's Inn. It is in the parish of St. Clement Danes, in the district between the two thoroughfares of Holborn and the Strand, and is surrounded by parishes and districts remarkable for the extreme poverty of a portion of their inhabitants and the density of their population. As these two conditions, poverty and density of population, have an obvious bearing upon the extent to which the charity is frequented by persons living in the neighbourhood, I subjoin two tables, the one showing the poverty, the other the density of the population, by comparison with other districts of the metropolis.

* No record, for instance, is kept of persons applying to have teeth extracted.

The poverty of the districts and parishes by which King's College Hospital is surrounded will be best shown by taking, as its test and measure, the poor rate compared with the house rent. A table, contained in the Cholera Report of the Registrar-General for 1848-9, will supply the figures necessary to this comparison.

In the annexed table four of the districts and parishes from which King's College Hospital receives its largest supply of patients are compared with the four parishes and districts which are highest and lowest on this scale of poverty.

I.—*Table shewing the amount of Poor Rate in the Pound of House Rent, in the year* 1842-3, *in Districts and Parishes of London.*

West London	·067	Rotherhithe	·143	Hanover Square, May Fair, and Belgrave	·018
St. Giles	·052	Bethnal Green	·136	St. James, Westminster	·023
Strand	·047	Bermondsey	·134	Islington	·030
Holborn	·034	St. George, Southwark	·089	Camberwell	·038

Average of 38 Metropolitan Districts	·064
,, 4 Central Districts	·050

From this tabular comparison it would appear that the central districts bordering upon the site of King's College Hospital, though not among the poorest in the metropolis, are very poor in comparison with the more favoured districts at the west end of London.

The density of the population in these central districts of London will be best shown by placing the London districts in the order of the number of persons to a square mile, beginning with that district which has the greatest number.

II.—*Table shewing the Density of Population in the several Districts and Parishes of London.*

	Persons to a Square Mile.		Persons to a Square Mile.		Persons to a Square Mile.
East London	185,751	Shoreditch	108,242	Bermondsey	44,770
Strand*	163,531	St. Saviour, Southwark	91,471	Chelsea	41,832
St. Luke	157,251	London City	82,480	St. George, Hanover Square	40,368
Holborn*	152,232	Bethnal Green	75,952	St. Pancras	29,342
St. James, Westminster	142,072	St. Olave, Southwark	73,373	Lambeth	22,209
St. Giles*	141,620	Marylebone	66,882	Islington	19,511
West London*	135,482	Newington	66,478	Rotherhithe	12,861
St. George-in-the-East	127,410	Stepney	56,401	Greenwich	11,849
Whitechapel	125,728	St. Martin-in-the-Fields	51,704	Poplar	10,344
St. George, Southwark	117,615	Westminster	45,790	Hackney	9,518
Clerkenwell	109,100			Camberwell	8,058
				Hampstead	3,406

* Unions and parishes in the neighbourhood of the hospital.

It results from this comparison that the districts and parishes

by which King's College Hospital is surrounded are very densely peopled; for it will be observed that the Strand Union comes second on the list, Holborn Union fourth, St. Giles sixth, and West London seventh. In other words, of the seven districts and parishes which stand first in point of density of population, four belong to the central districts of the metropolis, and are in the immediate neighbourhood of the hospital.

The parish of St. Luke, which stands third on the list, also belongs to the central districts, and sends a considerable number of patients to the hospital.

Two other circumstances which, in common with the poverty of the inhabitants and the density of the population, may be supposed to influence the attendance of patients at King's College Hospital, and which will have to be taken into account if we would make a general application of the facts ascertained in reference to this one hospital to other hospitals, and to the metropolis at large, are the proximity of other general hospitals, and the number of similar institutions in its more immediate neighbourhood.

Every general hospital may be said to have a district of its own from which it draws the greater part of its supply of patients. This district may be roughly traced out, as it is in the annexed plan, by fixing upon a number of points midway between the hospital itself and its several neighbours, and then joining these points by lines, preserving, as nearly as may be, an equal distance from each of the neighbouring hospitals. If, on a map constructed on this principle, the site of the several hospitals and dispensaries is indicated by characteristic marks, we shall be able to form a clear idea of the degree to which facts ascertained in respect of one hospital admit of general application.

It will be seen that the district from which the hospital draws its principal supply of patients is one of considerable extent and large population. It is bounded on the west by Wellington Street, Bow Street, and Endell Street; on the east by a line commencing at the north end of Bedford Row, and running diagonally between Fetter Lane and Farringdon Street to the foot of Blackfriars' Bridge; on the north by a line cutting the centre of Great Russell Street, and passing to the north of Bloomsbury Square and Theobald's Road; and on the south enclosing an undefined space, which may be roughly taken as equal to half of the triangle which has the Thames for its base and Waterloo and Blackfriars' Roads for its two sides.

Within this boundary line are comprised about half the Strand Union, about half the Holborn Union, about half the West London Union, about a fourth part of the parishes of St. Giles and St. George's Bloomsbury, and a small portion of the extensive parish of Lambeth; or, (to specify the several parishes and districts more particularly,) the whole of the parishes of St. Clement Danes and St. Mary-le-Strand, of St. Dunstan and St. Bride, the precinct of White Friars, the Liberty of the Rolls, and the Inns of Court, and parts of the parishes of St. Giles, St. George Bloomsbury, St. George the Martyr, St. Andrew Holborn, and Lambeth. The population of these parishes and districts may be roughly estimated at from 80,000 to 100,000.

In this district there is now but one general dispensary (the Public Dispensary in Carey Street, within a short distance of the hospital); but the Bloomsbury Dispensary is on, or near, the northern boundary line, the Farringdon Dispensary near the eastern boundary, and the Dispensary for children, in Waterloo Road, may also be said to lie within the district of the hospital.

To this account of the hospital and the district which may be said to pertain to it, it is only necessary to add, in order to give their due value to the facts about to be adduced, that though the governors and subscribers of the hospital have the usual privilege of recommending patients by letter, such privilege has, practically, no effect in checking the admission either of in or of out-patients. This will clearly appear from the following statement:—

Admitted with letters of recommendation from April, 1840 to January 31st, 1854	In-Patients	5,507
,, ,, ,,	Out-Patients*	2,050
	Total	7,557
Admitted without letters of recommendation during the same period	In-Patients	12,436
,, ,, ,,	Out-Patients	262,712
	Total	275,148
	Grand Total	282,705

It appears, then, that out of 17,943 in-patients admitted in less than 14 years, nearly 12,500 were received without letters of recommendation; while of 264,762 out-patients, (including casualties and poor married women attended at their own homes,) only about 2,000 brought with them letters of recommendation. The hospital is, therefore, a free hospital in the sense of offering, in practice, no impediment to the admission of in-patients or the attendance of out-patients. Add to this that casualties and accidents, slight or severe, are attended to at all hours; that in-patients are admitted twice a-week, and urgent cases or accidents at all times; and that out-patients are seen at one o'clock every day, and women and children at half-past twelve on three days of the week; and we have the case of an hospital placed under very favourable circumstances for testing the extent to which the labouring classes and the poor avail themselves of hospital accommodation, when the impediments to their attendance are reduced almost to a minimum.

The only other introductory explanation which I think it necessary to make is this: that no provision is made for visiting patients at their own homes. Though many such visits are paid, the hospital does not profess to supply this desideratum. This duty is generally understood to devolve upon dispensaries, and is performed by the dispensary in Carey Street, which has been already mentioned as being the single dispensary in the district of King's College Hospital.

* Out-patients include casualties (3,600 in 1854,) and married women attended at their own homes; but it is believed that the casualties actually returned form a very small proportion of the whole body of patients entered as *out-patients*.

By adding, as I shall presently do, the patients seen by the officers of this institution to the patients of King's College Hospital, we shall obtain a very exact notion of the amount of the benefits conferred by hospitals and dispensaries upon the working classes and the poor.

Having now stated, at some length, all the circumstances connected with King's College Hospital, which are necessary to be known in order to give their true and full value to the facts presently to be stated, I proceed to consider, one by one, the following points:—

1. The rate of increase of patients at King's College Hospital, taken as a measure of the rate of increase in institutions similarly circumstanced.

2. The number of patients arranged in parishes and districts, with the proportion which that number bears to the population of those parishes and districts.

3. The class of persons who avail themselves of the benefits conferred by hospitals, and their circumstances at the time of application.

1. *Rate of Increase.*—The rate of increase, in the case of hospitals situate in poor and crowded districts, and giving a ready and free access to patients, may be inferred from the following statement of the number of patients relieved year by year at King's College Hospital from the incomplete year 1840 to the end of 1854, inclusive.

	In-Patients.	Out-Patients.	Total.
1840*	778	4,056	4,834
1841†	1,255	8,214	9,469
1842	1,290	11,138	12,428
1843	1,131	11,643	12,774
1844	1,196	12,585	13,781
1845	1,160	15,933	17,093
1846	1,170	16,547	17,717
1847	1,253	17,901	19,154
1848	1,253	19,383	20,636
1849	1,261	21,048	22,309
1850	1,301	24,215	25,516
1851	1,244	29,363	30,607
1852	1,119	23,504	24,623
1853	1,257	22,813	24,070
1854	1,275	26,419	27,694

* The first patient was registered on the books on the 15th April, 1840.

† The midwifery department, for attending poor married women at their own homes, was established September 1, 1841.

Owing to the causes of disturbance which have been already referred to, there is no approach to regularity in the rate of increase of these figures. Suffice it, therefore, to observe, that from the opening of the hospital in the broken year, 1840, up to 1851, the year of the Great Exhibition, there has been a progressive and considerable increase of patients; and that since the last-named period, owing partly to want of accommodation, and partly to efforts made, for a time, to check the great influx of patients, the numbers have suffered some slight diminution, but with a notable increase of upwards of 3,500 patients in the year 1854.

1. St. Clement Danes, containing King's College Hospital.
2. District comprising St. Mary-le-Strand, St. Paul Covent Garden, &c.
3. St. Giles and St. George Bloomsbury.
4. St. George the Martyr.
5. St. Andrew Holborn.
6. Clerkenwell.
7. West London (including St. Dunstan's, St. Bride's, the Liberty of the Rolls, the Inns of Court, &c., and St. Bartholomew's Hospital.
8. 8. East London, containing several Dispensaries.
9. City of London.
10. Whitechapel, containing the London Hospital.
11. St. Olave and St. Thomas, containing St. Thomas's Hospital and Guy's Hospital.
12. St. Saviour's.
13. St. George's Southwark.
14. Lambeth.
15. St. Pancras, containing the North London and the Free Hospitals.
16. Mary-le-bone, containing Middlesex Hospital.
17. Paddington, containing St. Mary's Hospital.
18. St. George Hanover Square, containing St. George's Hospital.
19. St. Martin-in-the-Fields, containing Charing Cross Hospital.
20. St. Margaret Westminster, containing Westminster Hospital.

The shaded portion of the Map, surrounded by a dotted outline, represents the district of King's College Hospital, as defined in the text.

The squares mark the sites of general Hospitals, and the round dots of some of the leading special Hospitals and Dispensaries.

0 1 2 3 4 5 MILES

If the fifteen years comprised in the table are thrown into three groups of five years each, the numbers of patients will be as follows:—

53,286 .... 96,909 132,510

2. *The Number of Patients arranged in Parishes and Districts.*—As I have already stated, the patients of the hospital, whether in-patients or out-patients, from the first opening of the hospital until the present time, have been entered upon the books, with their residences and parishes, as far as they could be ascertained. It is from these entries, thus made, that I am able to obtain the very curious and striking results to which I am especially anxious to invite the attention of the Society. The entries in the books having been carefully abstracted year by year, I am able to state the number of accidents and attacks of illness from each parish or district, and comparing that number with the population, and making a correction, presently to be explained for double visits in the same year, to give, as I believe for the first time, some idea of the proportion of the population availing itself of the relief afforded by hospitals. I have arranged the parishes and districts in the table in the order of the benefits conferred, the amount of benefit being measured by the proportion of the population relieved. The table contains, under distinct headings, the name of the parish or district, the population in 1851, the number of patients in less than 14 years and in the last complete year, 1854, and the per-centage proportion which the number in that year bears to the population. It is necessary to explain that though the word patient is used in this table, what is really meant is separate and distinct accidents or attacks of illness.

Name of Parish or District.	Population, 1851.	Patients in less than 14 Years.				Total, Year 1854.	Per Centage Proportion to Population in 1851.	Per Centage Proportion of Whole Number attended in 1854.
		In-Patients.	Out-Patients.	Mid-wifery.	Total.			
St. Clement Danes and Clement's Inn	15,662	3,762	59,374	1,350	64,486	6,068	38·74	21·91
St. Mary-le-Strand	2,517	533	9,222	240	9,995	1,051	41·75	3·80
St. Dunstan's and the Temple	3,173	264	5,668	121	6,053	676	21·30	2·44
St. Giles	37,407	3,174	59,275	1,283	63,732	6,078	16·25	21·94
Liberty of the Rolls	2,567	211	3,589	58	3,858	383	14·92	1·38
St. Andrew, Holborn	29,320	1,302	29,848	885	32,035	3,183	10·85	11·49
St. Paul, Covent Garden	5,810	398	6,062	186	6,646	622	10·70	2·24
St. Martin-in-the-Fields	24,640	748	17,018	399	18,165	1,928	7·82	6·96
St. Bride and Whitefriars	7,269	273	3,874	83	4,230	489	6·72	1·76
St. George, Bloomsbury, and St. George the Martyr	25,570	725	14,306	258	15,289	1,454	5·68	5·25
St. Anne, Soho	17,335	324	6,525	167	7,016	770	4·44	2·78
City of London	55,932	535	5,111	77	5,713	571	1·02	2·06
Westminster	102,015	764	5,592	46	6,402	515	0·50	1·86
Southwark	106,930	155	3,232	20	3,407	432	0·40	1·56
Clerkenwell	64,778	332	4,461	107	4,900	467	0·72	1·70
Lambeth	139,325	452	5,542	47	6,041	882	0·63	3·18
St. Pancras	166,956	714	6,745	165	7,624	746	0·44	2·70
Marylebone	157,696	480	2,411	17	2,908	238	0·15	0·86
Environs of London	...	971	6,291	13	7,275	653	...	2·36
Rural Districts	...	1,773	3,226	...	4,999	482	...	1·74
Parishes unknown	...	63	1,863	5	1,931	6	...	...

From this table it would appear that the annual attendance at King's College Hospital, if measured by the number of distinct accidents and attacks of illness relieved, varies from upwards of 41 per cent. of the entire population in the parish of St. Mary, and upwards of 38 per cent. in the parish of St. Clement Danes down to 0·15 in the parish of Marylebone. To reduce these per-centage proportions to fractions more easily understood and appreciated:—the attendance at King's College Hospital, for one year, if measured by the number of distinct accidents or attacks of illness relieved, will be represented by about two-fifths of the population for St. Clement's and St. Mary's; one-fifth for St. Dunstan's; one-sixth for St. Giles'; one-seventh for the Liberty of the Rolls; one-tenth for St. Andrew Holborn, and St. Paul Covent Garden; one-thirteenth for St. Martin-in-the-Fields; one-fifteenth for St. Bride and Whitefriars; one-eighteenth for St. George Bloomsbury, and St. George the Martyr; one in twenty-two for St. Anne Soho; and about one per cent. for the city of London. For the remaining parishes and districts the proportion is less considerable.

The large amount of relief afforded to the inhabitants of the two parishes of St. Clement Danes and St. Mary-le-Strand, cannot but arrest the attention of the Society, especially when to the 6,068 cases treated in the year, there are added the inhabitants of the parish of St. Clement who contribute to make up the aggregate of patients seen or visited by the officers of the Public Dispensary in Carey Street. I have been favoured by Mr. Fullford, the resident medical officer of the dispensary, with the number of patients relieved by the charity during the year 1854. It is 4,497. I was also able to ascertain that 69 in 150 of these patients were inhabitants of St. Clement's. If this proportion held good for the whole number of patients, we should have 2,068 patients attending at the public dispensary from this one parish. Assuming this to be the case, the gratuitous relief afforded by these two charities would be represented by 8,136 cases per annum, or by a number exceeding half the population of the parish in 1851.

It will be observed that I have been speaking, hitherto, not of the number of persons attending the hospital, but of the number of accidents or attacks of illness treated at the hospital. In order to arrive at the number of *persons*, it will be necessary to make certain corrections in the foregoing table. With a view to obtain the means of making these corrections, I have, for some time past, ascertained, by inquiry of each new patient coming under my care, whether he, or she, had been previously under treatment, at the hospital, within the year. As the result of this inquiry, I find that out of 362 patients, 286 had never been at the hospital, or had not been there before for the space of a year, while 76 had been to the hospital (for the most part once only) in the same period. I also ascertained, what it may be interesting to state though not necessary for my present purpose, that of 276 patients, 138 attended for the first time; 66 for the second time; 31 for the third time; 13 for the fourth time; 5 for the fifth time; 4 for the sixth time; 3 for the seventh time; 3 for the eighth time; 1 for the ninth time; 1 for the tenth time; while 11 stated that they had

attended since the hospital had been in existence, upwards of ten times.

As I believe that the numbers 76 and 362 represent sufficiently closely the relation which the duplicate attendances within the year bear to the whole number of attendances, I propose to make use of the approximate fraction $\frac{2}{9}$ as the correction required to make the figures in the foregoing table represent the number of persons availing themselves of the benefits of the charity in the course of the year 1854.

The results of this correction are seen in the following table, which, therefore, exhibits the *number of persons* relieved at King's College Hospital, with the proportion per cent. of the population of the several parishes and districts in the year 1851.

Name of Parish or District.	Population, 1851.	Patients in 1854.	Per-Centage Proportion to Population in 1851.
St. Clement Danes	15,662	4,720	30·14
St. Mary-le-Strand	2,517	817	32·46
St. Dunstan and Temple	3,173	526	16·58
St. Giles	37,407	4,727	12·64
Liberty of the Rolls	2,567	298	11·60
St. Andrew, Holborn	29,320	2,475	8·44
St. Paul, Covent Garden	5,310	484	8·33
St. Martin-in-the-Fields	24,640	1,500	6·10
St. Bride and Whitefriars	7,269	380	5·23
St. George, Bloomsbury, and St. George Martyr	25,570	1,131	4·42
St. Anne, Soho	17,335	599	3·45
City of London	55,932	444	0·79
Westminster	102,015	400	0·39
Southwark	106,930	336	0·31
Clerkenwell	64,778	363	0·56
Lambeth	139,325	686	0·50
St. Pancras	166,956	580	0·35
Marylebone	157,696	185	0·12
Environs of London	....	508	....
Rural Districts	....	375	....
Parishes unknown	....	6	....
		21,540	

It appears then that even when this necessary correction has been made, and the number of persons is thus substituted for the number of attendances, the proportion to the population of the persons who make application to the hospital, within the year, is very considerable. It is little less than one-third in the parishes of St. Clement and St. Mary-le-Strand; about one-sixth in St. Dunstan's; more than one-eighth in St. Giles'; upwards of one-ninth in the Liberty of the Rolls; more than one-twelfth in St. Andrew's, Holborn; about a twelfth in St. Paul's, Covent Garden; about one-sixteenth in St. Martin's; more than five per cent. in St. Bride and Whitefriars; nearly four and a half per cent. in St. George, Bloomsbury, and St. George the Martyr; nearly three and a half per cent. in St Anne, Soho; about a half per cent. in

Clerkenwell and Lambeth; about three quarters per cent. in the city of London; about a third per cent. in Westminster, Southwark, and Lambeth; and a very small per centage in Marylebone. It is probable that these smaller proportions are all somewhat under stated, as duplicate attendances within the year are likely to be less numerous, in proportion, in districts remote from the hospital than in the parishes bordering upon it If in the case of St. Clement Danes, and St. Mary-le-Strand, we make even a moderate addition for patients visited at their own homes, or seen as out-patients at the public Dispensary in Carey Street, the attendance in these two parishes will certainly amount to one-third of their entire population.* In other words, one person in every three inhabitants of the parish, in addition to the very large number treated in the workhouse or by the parish doctor, applies for gratuitous medical attendance every year. This is so surprising and startling a fact, that I should be disposed to doubt its being fact if I could distrust the means by which I have arrived at it. But, I believe, that the entries in our books are sufficiently exact to lead to a very close approximation to the truth; and I have myself taken steps to test the accuracy of the calculations made by the gentleman who has, for years past, made the annual abstracts from the hospital books. The suspicion has even crossed my mind, that the large number of patients entered as belonging to the parish of St. Clement Danes, might be accounted for by supposing a great proportion, if not all, of the blanks in the books to have been filled up with the name of this parish. This theory, however, falls to the ground before the fact that the entries under the contiguous parish of St. Mary-le-Strand are even larger in proportion to the population, and there is certainly no reason why persons belonging to unknown parishes, should be set down as belonging to this small parochial district. It will also be observed that the number of persons attending in proportion to the population in the several parishes and districts comprised in the table, bears such a ratio to their respective populations as their proximity to the hospital would lead us to anticipate. St. Dunstan and the Temple follow next in order to St. Clement's and St. Mary's; then St. Giles' and the Liberty of the Rolls; then the somewhat more remote parishes of St. Andrew Holborn, and St. Paul Covent Garden; then St. Martin-in-the-Fields (which, be it recollected, has a general hospital within its own limits), with St. Bride and Whitefriars; next in order we have the parishes of St. George Bloomsbury and St. George the Martyr, separated from the hospital by the busy thoroughfare of Holborn; and then St. Anne Soho. The city of London, Westminster, Southwark, Clerkenwell, Lambeth, and St. Pancras, though still more remote, and having, with the exception of Clerkenwell and Lambeth, general hospitals within their limits, all supply a notable though greatly inferior, proportion of patients.

I do not, therefore, think that there is any exaggeration in the

* If we assume the proportion of the patients attending at the Public Dispensary from St. Clement's parish, twice in the course of the year, to be the same as in the case of the patients of King's College Hospital, the total number of *patients* attended by the two institutions will be 6,351, or more than two-fifths of the entire population in 1851.

statement that nearly a third of the whole population of the parishes of St. Clement Danes and St. Mary-le-Strand apply for medical relief to King's College Hospital every year.

So remarkable and unexpected a circumstance as this must of necessity excite our curiosity to know who and what are the persons who thus apply to this charity, and to similar charities, for relief. This brings me to the third division of my inquiry, namely—the class of persons who avail themselves of the benefits conferred by hospitals, and their circumstances at the time of application.

It must be self-evident, in the first place, that the great bulk of the applicants cannot be poor persons in the proper acceptation of that term. It is quite out of the question that in the heart of the metropolis of a wealthy nation, making provision by a system of Poor Laws for the destitute portion of its population, one-third or two-fifths of the inhabitants of one parish should be found in such a state of want as to be proper objects of gratuitous aid in sickness. Some considerable class of persons, other than the poor and destitute, must apply to these charities in very large numbers; and that class can be no other than the class of working men. Nor is this large attendance to be accounted for on any other supposition than that the whole body of working men, their wives and families, or at least a very considerable proportion of them, frequent our hospitals and dispensaries even when not driven to do so by want of employment, or previous exhaustion of their resources. The men who are out of work, with their wives and children, could not possibly supply so large a number of patients.

Though, for these reasons, there seemed to me no room to doubt that a very considerable proportion of the patients attending at our hospitals must be in work, I deemed it desirable to put this opinion to the test; and have, accordingly, for some time past, inquired of each adult male patient whether he was in work or out of work, and have noted down the results of my inquiry, setting down as out of work all who had been obliged to strike work even for a few days. I obtained as the result of this inquiry the following figures:—

In work, 230. Out of work, 105.*

So that about two-thirds of the men who present themselves for gratuitous advice and relief at the hospital are in work at the time; and, if we assume that this proportion reigns among the husbands and fathers of the women and children, who apply for relief, we shall have a total of nearly 20,000 men in the receipt of wages, obtaining charitable aid in their own persons, or in the persons of their wives and children, at one hospital, in the course of a single year.

I have also made some inquiries as to the wages which the patients are in the habit of receiving. I have asked them what wages are esteemed good wages in their respective trades, and find the sums to vary from 12 and 14 shillings a week, up to 50 shillings; and in some few cases to 5*l.* or 6*l.* a week. It may be well to state the exact results of these inquiries.

* I also ascertained that of 13 women presenting themselves as patients, 7 were in work, and 6 out of work; and that of single women and widows, 8 were in work, and 4 out of work.

Number of Men.	Wages. Shillings.	Number of Men.	Wages. Shillings.	Number of Men.	Wages. Shillings.
2	12	2	22	3	33
3	14	3	25	1	35
2	16	4	26	7	36
1	17	1	27	2	40
7	18	1	29	2	50
8	20	14	30	1	upwards of 50
3	21				

So that out of 67 men in work, of whom inquiry was made respecting their wages, 52, or more than five-sevenths followed occupations in which men fully employed may earn 20 shillings a week and upwards; 39, or more than half the number, 25 shillings a week and upwards; and 30, or little less than half, 30 shillings a week and upwards.

On the other hand, a few lads, and a few infirm men, and some men following irregular occupations, were receiving less than 12 shillings a week. Many single women and widows, it is well known, also earn small wages, and are habitually in circumstances to render them proper objects for charitable assistance. Again, some of the applicants to hospitals, though in the receipt of good wages, and not having had their resources drained away by severe diseases or chronic maladies, are not altogether improper objects of charity; for they may have parents or near relations to support, or they may have been out of work at some previous period, and not have had time to recruit their finances.

I am very far, then, from asserting that no man who is in work, and in the receipt of good wages, ought to present himself, or to send his wife and children, to an hospital or dispensary for relief; but, I infer, both from the large figures I have now adduced, and, from the experience of fourteen years as a physician to out-patients, backed by frequent inquiries addressed to persons making application for relief, that a very considerable proportion of our patients are not objects of charity in the sense of being in a state of distress and poverty, much less of destitution. I may also add that, in a large majority of instances, application is made to the hospital in the early stage of very trifling maladies, the patient not having applied to any medical man for advice.

Those benevolent persons, therefore, who have hitherto subscribed to the support of hospitals and dispensaries, on the supposition that they were providing for the relief of the poor and destitute, must be content to modify, perhaps to enlarge, their views. They must understand that they are subscribing, not merely for the relief of poor and destitute persons, but in order to provide the most skilful treatment and the best advice for the working population.

If this more enlarged view of the real function of hospitals should prove unwelcome to their supporters—if they would still desire to provide only for the poor, and for working men out of employment, and not for men in work, or in place, and in receipt of good wages, I would invite them to consider the difficulties which must always stand in the way of every attempt at limitation.

But, before I proceed to discuss this important question, I ought, perhaps, to remind the Society in general terms of the results to which my figures seem to have conducted me.

Making use of the facts collected in respect of one hospital, I think that I have succeeded in proving :—

1. That when an hospital is established in a poor and crowded district, with great facilities for the attendance of patients, and few or no obstacles to their admission, a very large and rapidly increasing number of persons apply for relief, and that that number amounts at length to a very considerable fraction of the whole population.

2. That of the persons so applying for relief, a very large proportion consists of men in work, and in the receipt of good wages; or of the wives and children of men in employment and well paid.

3. That after subtracting men who are out of work and men inadequately paid, and the wives and children of men so circumstanced; and further deducting those men who, though at the time in receipt of good wages, have been out of work for a season, and those, again, who habitually contribute to the support of their parents or near relations; there will still remain a very considerable body of artizans and working men who are not proper objects of charity, in the usual acceptation of the term, and who are in the habit of making application to hospitals, often for very trifling illnesses, and without having previously consulted any medical man. As there is nothing in the nature of things to prevent the statements embodied in these three propositions from being applied to all our hospitals and dispensaries, in a degree proportioned to the poverty and density of their surrounding populations on the one hand, and the more or less stringent nature of their rules of admission on the other, I shall submit to the consideration of the society these three questions, in which the managing bodies of all our hospitals and dispensaries are interested.

1. Are artizans and working men, as such, and without regard to their circumstances at the time of application, to be considered as proper objects for gratuitous medical relief?

2. If not, is it possible to frame any rules by which the necessitous members of the working class shall be admitted, and the non-necessitous excluded?

3. Is there any way in which the working classes may be made to contribute, in some fair proportion to their means, to the support of the charities which they use so largely?

1. In reference to the first question :—

Whether artizans and working men, as such, and irrespective of their circumstances, are to be considered as proper objects of gratuitous medical relief? I may observe that I have reason to believe that there is a very prevalent impression among the most liberal subscribers to charitable institutions, that working men, as working men, are proper objects for gratuitous relief at hospitals. Though I am not myself of this opinion, and believe it to be an unsound and mischievous doctrine, I have no hope of seeing it abandoned by any considerable portion of the charitable public; although the injustice it inflicts upon the members of the medical profession, (and on those druggists who confine themselves to pre-

paring medicines prescribed by qualified medical men) resident in the neighbourhood of our hospitals and dispensaries, is too obvious to admit of dispute.

2. Assuming this question to have been answered in the negative, the next inquiry which presents itself is, whether it is possible to frame any rules by which the necessitous artizan and working man may be admitted, and the non-necessitous excluded? A very little consideration will suffice to convince us of the difficulty, if not the impossibility, of framing any such rules. The admission of the one class, and the exclusion of the other, would have to be brought about by the agency of persons wanting in the necessary knowledge of the class with whom they have to deal, and too much occupied to be able to make the necessary inquiries. Such inquiries, if made at all, could not be undertaken at the hospital itself, either by the secretary or by the medical officers; and the mere outward appearance of the patients would afford but little assistance, for some of the poorest must be decently dressed, or they would sacrifice their chance of earning a living, while those who are best off habitually present themselves in their working dress, or even in rags. Beyond putting to the more respectable class of applicants the questions whether they are aware that the institution to which they make application is a charity, and whether they consider themselves to be proper objects of charity—questions very generally answered in the affirmative—little can be done. So that if discrimination is to be made anywhere, it must be through the agency of subscribers' letters.

I have already stated that when, previous to the opening of the new hospital, the influx of patients became so great as to cause serious inconvenience, an attempt was made to limit the numbers by requiring in every case a governor's or subscriber's letter of recommendation; but that experience of the inconvenience attending this plan, led to its abandonment. The fact is, that by rigidly requiring letters of recommendation in every case, we only add to the pecuniary obligation of the subscriber the harassing trouble of signing these letters of recommendation; and working men will find their way as naturally to the subscribers who are most easy in disposition, and most lax in their notions of what charity is and ought to be, as the mendicant does to the persons who are guilty of indiscriminate almsgiving. When the pressure on the subscribers, who live nearest to the hospital, and are most easy of access, at length becomes intolerable, they see no way to release themselves but by discontinuing their subscriptions. The attempt, therefore, to limit attendance, and exclude improper persons, by rigidly requiring letters of recommendation, does not succeed, and acts injuriously upon the charity.

It ought also to be borne in mind that the subscriber to an hospital or dispensary, often looks upon his subscription as the purchase money of an absolute and unqualified right to recommend to the charity, for what he considers to be "the best advice," any person whom he may be pleased to send. Add to this that too many medical men, by their own practice of giving gratuitous advice, and by their own exceptions in favor of particular classes of the community (as, for instance, the unbeneficed clergy), have largely contributed to create the opinion that society has a claim upon the

services of medical men, which it does not dream of asserting in the case of the members of any other profession whatever, and it will be seen how hopeless it is to attempt to check the abuses of our medical charities by means of those who contribute to their support.

On the other hand, it would be unreasonable to expect any sudden change in the opinions or habits of the working class. So long as the supporters of our medical charities believe that working men, as such, are proper objects of gratuitous aid in sickness; and so long as there are to be found among them men who maintain the extreme doctrine, that a subscription to an hospital confers an absolute right of recommendation, without regard to the circumstances of the persons recommended, it is scarcely to be expected that working men, seeing these opinions carried into actual practice at our hospitals and dispensaries, should think themselves in the wrong in freely resorting to them.

It ought also to be borne in mind that though the original object and use of hospitals and dispensaries was to provide relief for the poor and destitute, the rare opportunities of experience which they afford to their medical officers, has led them to be regarded as the places where the best advice is to be obtained; and it is but natural that working men feeling that, at the usual rate of remuneration, such advice is beyond their means, should apply to hospitals and dispensaries for it;—without expecting, perhaps, to obtain gratuitously the medicines which we have fallen into the habit of giving them as freely as the advice itself.

This consideration leads me to the third and last question:—is there any way in which the working classes may be made to contribute, in some fair proportion to their means, to the support of our hospitals? I answer, without hesitation, by levying a small payment for medicines. I say, *without hesitation*, because having submitted to the medical committee of the hospital with which I am connected, a proposal for charging the out-patients, on their second visit, the sum of one shilling for the medicine required during an entire illness, coupled with a plan for excepting the really poor, that proposal received the unanimous and cordial assent of a very full meeting, and has since been heartily approved by several persons practically acquainted with the habits, feelings, and resources of working men.

If this moderate payment were enforced, a very acceptable addition would be made to the funds of our medical charities, and the great and wealthy working class who are known to expend such a gigantic aggregate sum on the fruitful causes of disease, would contribute something to the support of the charitable institutions of which they are in the habit of making so frequent a use.

This contribution once obtained, the gentlemen who devote themselves, in so praiseworthy a manner, to the management of our great medical charities, might appeal with increased confidence to that comparatively small section of the public which now supports them by contributions almost beyond its means, under the conviction that hospitals are, of all charities, the least liable to abuse, and the most prolific of benefits, physical, moral, and religious, to every class of the community.

Analysis of the Statistics of the Clearing House during the year 1839. By Charles Babbage, Esq., F.R.S., *Cor. Memb. of the Institute of France.*

[Read before the Statistical Society, on Monday, the 18th of June, 1855.]

In the examination of various economical questions, it is desirable, if possible, to know the amount of exchanges as measured by money, which are made daily throughout the whole year. It would be almost impossible to ascertain the exact amount, but even a rough approximation would be valuable. If we could arrive at some means of obtaining the proportions in which this amount has varied in past times, it would be a very useful guide to the future.

In the following paper it is proposed to make some approach towards this object by instituting a series of comparisons of the facts given respecting the daily clearing in the year 1839.—See Appendix to Second Report on Banks of Issue (1841), Parl. P. No. 320a.

To obtain some knowledge of the total amount of the sum which changes hands during the year, it would be necessary to know—

1st. The proportion of the transactions of bankers which passes through the Clearing House to that which does not.

2nd. The proportion which the transactions of those bankers who clear bears to the transactions of the bankers who do not clear.

3rd. The proportion which the money transactions of the capital bears to those of the country.

4th. The proportion of payments made in bank notes or coin by the public, both in town and in the country.

The first curve* is deduced from the first table, which is itself to be found in the parliamentary returns. This curve exhibits to the eye the various changes in the amount of the daily clearing during the year 1839.

The first table is, in fact, the raw material, of which the *succeeding tables* are the manufactured articles.

Of the Days of the Week on which the Clearance is a Maximum.

One of the first facts which strikes the attention in examining this curve, or the table itself is, that the *clearing of Saturday is most frequently larger than that of the following Monday.* On counting the instances it appears that on

46 Saturdays the clearings are greater than on the following Mondays.
6 Saturdays the clearings are less.

The law is so well supported that it becomes interesting to examine the six excepted cases. They occur in the weeks numbered

5 IB	37 FS
15 FS	39 FS
28 FS	50 FS

It will be found, in a subsequent page, that each of those apparent exceptions was produced by the occurrence on the following Monday of a cause which always augments the clearing. The initials of those causes are placed by the side of *each exception.*

* These curves are too large for engraving, but are preserved in the library of the Society.

The next rule which presented itself was that *the clearing of Tuesday is usually larger than that of Monday.* There are 42 instances favourable, and 10 adverse, to this law.

The ten exceptions occur in the weeks

6 IB	29 FS
7	38 FS
10 IB	39
14	40 FS
16 FS	51 FS

It was afterwards ascertained that seven of these exceptions were accounted for by the fact that those Mondays happened to fall on days when inland bills became due, or on days of settlement, at the Foreign Stock Exchange. Thus in 49 cases out of 52 this law is verified. The three excepted cases occur in

Tuesday ..... 12th February.
,, ... 2nd April (Easter week).
,, ... 24th September.

If we now examine generally the six days of the week and assign to each those days on which its clearing has been a maximum we shall have the following table, where the figures under each week-day denote those weeks of the year in which the largest clearing happened on that week-day. The initial letters attached, indicate the actions of disturbing causes afterwards established.

	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.		
	6 IB	23 IB	3 ES, FS	7 FS	1 IB	2	19	32
	10 IB	42 ES	36 IB	11 FS	22 ES, FS	4	20	33
	16 FS	45	...	13 FS	24 FS	5	21	34
	29 FS, ES	49	...	35 ES, FS	26 FS	8	25	37
	38 FS	52 Xmasday	...	44 ES, FS	46 FS	9	27	39
	40 FS, IB	...	...	...	48 FS	14	28	41
	51 FS	...	...	...	...	15	30	43
	...	...	...	...	...	17	31	47
	...	...	...	...	...	18 IB	12	50
	7	5	2	5	6	27		
Deducting those dependent on IB, ES, FS, and Christmas Day	7	3	2	5	6			
	...	2	...	...	...			

It appears that in every instance, except two, there are disturbing causes which will afterwards be shewn to account sufficiently for Saturday not having, in those cases, the largest clearing. Thus out of fifty-two instances only two are adverse to *the* principle that *the largest clearing of the week is on Saturday.* These two exceptions occur in the forty-fifth and forty-ninth weeks, and it is to be remarked that the maximum of both those weeks occurs on Tuesday, which, except Saturday, supplies on the whole the next largest number of maximum clearings. It will also be found on turning to Table I., that the 4th of the month, on which day most inland bills are paid, *occurs in the* forty-fifth and forty-ninth week.

Of the Days of the Week in which the Clearing is a Minimum.

On examining the curve, or the table of clearings, it will readily be perceived that Thursday is usually the day of least clearing. The following table contains the number of those weeks in which each day of the week presents a minimum.

Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
2	1	5	4 37	44	....
3	16	7	6 38	....	....
9	29	10	8 39	....	....
20	....	11	19 40	....	....
27	....	12	21 41	....	....
28	....	13	22 42	....	....
31	....	14	23 43	....	....
48	....	15	24 45	....	....
49	....	17	25 46	....	....
....	....	18	32 47	....	....
....	....	26	34 52	....	....
....	....	30	36	....	....
....	....	33		....	....
....	....	35		....	....
....	....	50		....	....
....	....	51		....	....
No. of weeks 9	3	16	23	1	....

This shows a less frequent occurrence of a minimum on Thursday than is really the case. For when any of the disturbing causes occur on Thursday, its clearing is of course augmented. Now in the weeks numbered below, the respective events indicated occurred on certain Thursdays.

44	FS	15	ES
5		35	
7			
9		14	IB
11		27	
13			
20			
33			
8		4	

which, but for those causes, would probably have been minima.

These 12 disturbances being added to the 23 cases and subtracted from the 29, give for the occurrence of a minimum on Thursdays, the ratio of 35 to 17. This will be still further corrected if we consider that on the second week Thursday was the day after dividends were paid, and that in the 28th week Thursday was two days after dividends were paid. The numbers then become 37 to 15.

It may also be observed that in the weeks numbered below, Thursday either preceded or followed the days of disturbance there indicated.

Thursday.		The only weeks in which no obvious disturbance occurs.
Preceded.	Followed.	
27 IB	3 ES	10
48 ES	31 FS	12
....	48 FS	17
....	49 IB	30
....	26 FS	50
....	....	51
2	5	6

The twenty-seventh week has already been accounted for in the last correction, and the forty-eighth week has two sources of disturbance, namely, both the English and the Foreign settlement; it must, however, be accounted for only once. The extent to which these settlements disturb the amount of the clearings on other days of the *same* week in which they occur, can scarcely yet be made out until we possess a larger number of facts than have yet been supplied by the Clearing House.

From our present information it seems that these five instances ought to be subtracted, so that ultimately the frequency of a minimum clearing happening on a Thursday is about 42 out of 52 weeks.

Of the Relative Amount of Clearings on each Day of the Week.

In Table VIII., the annual average clearing of each week-day is given. These results are of course influenced by the three great causes of disturbance. In Table IX., those weeks only have been selected in which these causes do not occur. The following are the results:—

	Average Clearing of each day of the Week.	Per Centage.	Average Clearing of each day of the week, omitting IB, ES, FS.	Per Centage.
Saturday	3,621,700	5·82	3,575,000	5·81
Tuesday	3,292,600	7·11	3,123,200	7·39
Friday	3,098,800	6·58	2,912,900	7·09
Monday	2,927,700	7·31	2,653,200	7·71
Wednesday	2,734,400	7·61	2,514,700	7·89
Thursday.....	2,725,000	7·32	2,367,400	8·00

It appears, from both averages, that the greatest clearing occurs on Saturday, and the least clearing on Thursday. It might, perhaps, have been anticipated that Saturday would have supplied the largest

clearings; because those bills which are due on Sunday must be paid on Saturday.

A considerable portion, however, of the excess of Saturday's clearing, probably arises from the circumstance that employers usually send to their banker on the Saturday morning for money to pay their workmen in the evening. Those retail dealers who employ a banker, and who do not send their cash to him daily or twice in the week, will yet send it on the Saturday night, both for safe custody and for interest, if interest is allowed. The magnitude of the clearing with reference to the days of the week, seems to depend, in a great measure, upon the arrangements of the Bank of England.

Monday and Saturday are "private transfer" days, and on those days the Bank requires a fee of 2*s.* 6*d.* on each transfer. A similar fee is paid on all transfers made after one o'clock on other days, the consequence is that all transactions after one o'clock on Friday, except when an immediate settlement of the transaction is required, are made for settlement on the Tuesday following; this day, therefore, has to bear the settlement of all sales or purchases made on Friday afternoon, on Saturday, on Monday, and on the forenoon of Tuesday itself. Friday has its share of this pressure, because, parties knowing they cannot, without a fee, obtain money by transfer of stock till the following Tuesday, usually supply their wants on Friday.

This explanation applies to sales and purchases of stock, but still more to loans of money; for, although the fee is too small to make it of much consequence when a new loan is wanted, yet it has the effect of making parties select, beforehand, those days, in preference to any others for the settlement of pending loans.

The influence of days of private transfer at the bank in deciding the days of payment of loans, is fully proved by the following table, which I have been permitted to make use of. Out of 220 loans, occurring during a short period in the year 1849, the following numbers were settled on the several days of the week:

Monday	6
Tuesday	120
Wednesday	17
Thursday	11
Friday	58
Saturday	8
	220

These interesting facts were communicated to me by Mr. Alexander Trotter, to whose kindness I am also indebted for the preceding explanation of the influence of the days of private transfer on the clearings of the various days of the week.

For the purpose of ascertaining the probable causes influencing the amount cleared, two tables were formed, Table II, which contains the 30 largest clearings in the year, Table III, which contains the 30 smallest clearings.

From the table of greatest clearings the following tables were formed.

Days of the Week.	Number of Occurrences of Maxima.	Days of the Month.	Number of Occurrences of Maxima.	Months.	Number of Occurrences of Maxima.
Monday	6	2	1	January	3
		3	2	February	3
Tuesday	6	4	5	March	3
		6	1	April	3
Wednesday	4	12	1	May	2
		14	1	June	1
Thursday....	4	15	5	July	2
		16	3	August	3
Friday	5	17	1	September	2
		26	1	October	4
Saturday	5	27	1	November	3
		28	1	December	1
	30	29	2		
		30	3		30
		31	2		
			30		

The first subsidiary table gives little information respecting the days of the week; but the second table points out distinctly three maxima on the 4th and 15th, and the 30th of the month.

A table, No. VI, was now prepared from table I, which showed the average clearing of each day of the month during the year 1839. This is expressed by the curve D, plate 3. The result of this examination of the whole of the facts showed that three causes of large clearing exist near the beginning, the middle, and the end of the month.

The influence of a large number of inland bills being drawn payable on the first of the month, explained the first maximum; for, adding the three days of grace, those bills become payable on the fourth of each month. When the fourth of the month happens on a Sunday, those bills are paid on the third, the previous Saturday.

The days appointed for the settlement at the English and at the Foreign Stock Exchange would obviously influence the amount of the clearings. Those days having been ascertained for the year 1839, the initials IB for inland bills, ES for settlement at English Stock Exchange, and FS for settlement at the Foreign Stock Exchange, were written against their respective days of occurrence on the list of original data, and also on other tables deduced from them.

Thus the three maxima of the month were accounted for:—that of the 4th by the occurrence of days of payment of inland bills, those of the 15th and 30th by the occurrence of the bi-monthly days of settlement at the Foreign Stock Exchange.

Having thus ascertained three disturbing causes, it became necessary to reconstruct the curves by applying the corrections consequent upon them. New curves were deduced, by omitting all those days on which the disturbing causes acted; these are placed on the plates immediately under the uncorrected curves.

Table III contains the 30 smallest clearings of the year 1839. Similar subsidiary tables were made, as follows:—

Days of the Week.	Number of Occurrences of Minima.	Days of the Month.	Number of Occurrences of Minima.	Months.	Number of Occurrences of Minima.
Monday	2	1	1	January	3
		2	1	February	1
Tuesday	....	3	1	March	....
		5	1	April	1
Wednesday	9	6	1	May	6
		9	2	June	6
Thursday....	19	10	1	July	....
		11	1	August	....
Friday	....	12	2	September	5
		13	2	October	3
Saturday	....	18	2	November	1
		19	2	December	4
	30	20	1		30
		21	2		
		23	1		
		24	3		
		26	3		
		27	2		
		30	1		
			30		

It is remarkable that in this table, 19 or nearly two thirds of the smallest clearings occur on Thursday, which is found to be that day of the week on which the smallest clearings occur. Nine of the remaining smallest clearings occur on Wednesday, and two on Monday, thus leaving three days of the week, Saturday, Tuesday, and Friday on which none occur.

Amount of clearing due to influence of IB, ES, and FS.

We are now in a position to judge, at least approximately, the effects of these disturbing causes.

If we consider any week in which only one disturbing cause acts, as for example, inland bills, we may substitute for the disturbed day half the sum of the clearings on the same week days of the preceding and subsequent week.

The first columns of Tables XVII, XVIII, XIX, are deduced from this computation.

Perhaps a more accurate determination of these influences will result from the second columns of the same tables.

Taking as before any week in which only one disturbing force occurs, proceed thus: omit the clearing of the day on which the disturbing cause acts; take the sum of the clearings of the other five week days; take from the *average* week the sum of the clearings of *its* same five week days; then, as the sum of the five *average* week-days is to its remaining day, so is the sum of the five days of the week taken, to the *natural* value of its remaining day, if there were no other cause acting; subtract this last result from the amount of clearing due to the exceptional day, and the remainder is the amount due to the exceptional cause alone.

On these principles the second columns of the above tables have been calculated.

With respect to the amount of clearing arising from inland bills, it appears that there are in the course of the year, three, or perhaps four periods of maxima.

By 1st Computation.	By 2nd Computation.
4th February	4th February
4th June	4th June
4th September	4th September
4th December	4th December

The periods of minima are—

By 1st Computation.	By 2nd Computation.
4th January	.....
4th April	4th April
4th July	4th July
4th November	4th November

The days of maximum and minimum effect on the clearings arising from the settlement at the English Stock Exchange are—

By 1st Computation.		By 2nd Computation.	
Maximum.	Minimum.	Maximum.	Minimum.
16th January	11th April	11th April	26th February
29th August	27th November	29th August	28th May

The days of maximum and minimum effect on the clearings arising from the settlement at the Foreign Stock Exchange are—

By 1st Computation.		By 2nd Computation.	
Maximum.	Minimum.	Maximum.	Minimum.
14th February	15th January	14th February	15th January
15th April	14th March	28th March	28th February
31st May	30th April	31st May	16th May
15th July	14th June	28th June	14th June
30th September	31st July	30th September	31st July
31st October	16th October	31st October	16th October
16th December	29th November		

Of the Per-Centage of Bank Notes used in Clearing.

Table IV contains the thirty largest, and Table V the thirty smallest, per-centages of the bank notes used in the clearings of 1839.

It will be observed that only three of the clearings out of the thirty largest per-centages are above 3,000,000*l.*; whilst, on the other hand, only five of the clearings belonging to the thirty smallest per-centages are under that sum.

With respect to the days of the week we find—

In the 30 largest Per-Centages.	Number of Occurrences.
Monday	7
Tuesday	3
Wednesday	8
Thursday	9
Friday	3
Saturday	0
	30

In the 30 smallest Per-Centages.	Number of Occurrences.
Monday	3
Tuesday	3
Wednesday	4
Thursday	4
Friday	5
Saturday	11
	30

From these tables it appears that Saturday, which, amongst the days of the week, has usually the largest clearing, has also generally a small per centage of bank notes.

Thursday, which usually has the smallest clearing, has generally a large per-centage of bank notes.

On examining Table II, which contains the thirty largest clearings we find that whilst the clearings range from 4,018,800*l.* to 6,209,900*l.*, the per-centages range from 4·1 to 7·8. On the other hand in Table III, containing the thirty smallest clearings, whilst the clearings range from 1,529,700*l.* to 2,224,200*l.*, the per-centages range from 5·2 to 12·3.

	Clearings.	Per-Centages.
Average of 30 largest	4,553,600	5·49
,, smallest	2,006,800	8·45

From Tables XIV, XV, XVI, we find the following averages deduced from all the days of—

	Clearing.	Per-Centage.
English settlement	4,504,400	6·42
Foreign settlement	4,148,900	5·66
Inland bills	4,092,100	6·61
Saturdays, excluding IB, ES, FS	3,575,000	5·81

The general principle seems to be, that the larger the clearing the smaller the per-centage of bank notes used in the operations. This is remarkably confirmed by the two lists of the thirty largest and the thirty smallest clearings, where the various disturbing causes are mixed indiscriminately. When, however, those causes are separately considered, as in the case of inland bills, English settlements, Foreign settlements, and Saturday Clearings, this per-centage seems to indicate that it is influenced both by the total amount of clearing, and also by the greater or less magnitude of the individual bills.

In making this analysis I believe I have not pressed the very limited data beyond the principles they are capable of supporting

The application of more refined means of disentangling the laws which govern the clearings was unnecessary for the present purpose, although it will become desirable when we possess a larger number of facts.

I am not only strongly impressed with the importance of collecting and publishing the clearings of former years, if that be possible, but I also believe a periodical publication, annually or monthly, would be of great advantage.

The complicated phenomena of the atmosphere can only be explained by long continued and daily observations of the barometer, thermometer, hygrometer, and various other instruments. In the equally complicated phenomena of currency and exchanges, we have little hope of fully unravelling their laws, except through patient observations, continually made and published, of those monetary transactions which are constantly fluctuating. The weekly returns of the Bank of England may perhaps be considered as our economical barometer, and other commercial publications be likened to other instruments; but, I believe, few will be found of greater importance than the publication of returns from the Clearing House.

In order to bring the question in a more definite form under the consideration of the Statistical Society, I shall point out various steps in advance which may be looked forward to as favourable opportunities arise.

In the first place, it is not only quite unnecessary, but it would be useless to know the amount cleared by any individual banker. What is required is the *total* amount of the whole clearing, and of the amount of bank notes by which the operation was completed.

For the past it is important to procure and to publish the records of as many years as can be recovered of the clearings of former years. Even a few isolated years would not be without considerable value.

For the future it is desirable—

1. To have the clearing published annually.
2. „ „ „ monthly.
3. „ „ „ weekly.
4. If it can be accomplished, it is desirable to have also the number of bills passing through the house daily.
5. To have the numbers of bills arranged more or less according to their amount, thus:

Number of bills under	£	10
„	„	100
„	„	1,000
„	„	10,000

I would by no means suggest that these latter plans should be attempted at present. If we could succeed in getting the clearings of the last ten or fifteen years published, I believe the inquiries to which they would give rise would ultimately lead to more extended and more immediate publication.

P.S.—I deeply regret to learn that information which I had long doubted is now found to be too correct, namely, that although the daily amount of bank notes used in clearing has been registered, yet that the total of the sums cleared on each day has not been preserved. It is at least to be wished that for the future these amounts may be recorded and preserved for the use of a time when no objection shall exist to their publication.—C. B.

Table II.

The 30 Largest Clearings in 1839.

N.B.—Those 11 marked thus (*) occur in Table V. amongst the 30 smallest per centages,—*none* amongst the largest.

	Date.	Clearing.	Bank Notes.	Clearing Per Cent.
*ES	Tu. 15 Oct.	6,209,900	271,300	4·4
ES	Th. 29 Aug.	5,267,800	375,900	7·1
IB	M. 4 Feb.	5,107,900	331,700	6·5
*FS	M. 30 Sep.	5,087,500	232,900	4·6
IB	S. 4 May	5,025,800	272,200	5·4
*FS	F. 15 Nov.	4,883,200	204,600	4·2
FS	M. 16 Sept.	4,758,700	249,000	5·2
FS	M. 15 April	4,734,500	285,300	6·0
*FS	W. 16 Oct.	4,730,000	232,000	4·9
*	S. 2 Mar.	4,653,000	199,600	4·3
*	S. 6 April	4,591,000	189,800	4·1
*FS	F. 30 Aug.	4,587,400	208,200	4·5
IB	S. 3 Aug.	4,554,500	291,000	6·4
*FS	Th. 31 Oct.	4,533,000	219,100	4·8
IB	Tu. 4 June	4,518,300	345,500	7·7
FS	Th. 28 Mar.	4,447,000	243,700	5·5
FS	F. 29 Nov.	4,393,400	266,800	6·1
	S. 12 Jan.	4,372,700	223,800	5·1
FS	Tu. 15 Jan.	4,351,100	250,900	5·8
ES	W. 16 Jan.	4,336,300	288,700	6·7
*FS	Tu. 30 April	4,316,400	116,400	3·9
IB	M. 4 Mar.	4,291,300	317,100	7·4
*ES	W. 27 Nov.	4,253,000	178,500	4·4
†FS	M. 15 July	4,160,300	237,100	5·7
FS	F. 31 May	4,117,200	233,200	5·7
ES	W. 17 July	4,099,200	317,500	7·8
IB	F. 4 Oct.	4,090,600	255,600	6·3
	Tu. 3 Dec.	4,089,800	228,500	5·6
ES	Tu. 26 Feb.	4,027,700	253,700	6·3
*FS	Th. 14 Feb.	4,018,800	181,200	4·5
		136,607,300	7,500,800	
	Average	4,553,600	250,000	5·49

† Bank offers to sell Dead Wt.

	Number of Occurrences.
Inland Bills	6
English Settlement	6
Foreign Settlement	14
Saturdays	3
Tuesdays	1
	30

Table III.

The 30 Smallest Clearings in 1839.

N.B.—Those 6 marked thus (*) occur Table IV. amongst the 30 largest per-centag None occur amongst the smallest, Table V

Date.	Clearing.	Bank Notes.	Clearin Per Cen
W. 9 Oct.	2,244,200	150,500	6·7
Th. 19 Dec.	2,240,300	138,800	6·2
W. 12 June	2,221,700	148,100	6·7
*W. 24 April	2,212,000	227,200	10·3
M. 13 May	2,204,600	201,300	9·2
Th. 23 May	2,203,300	186,100	8·5
Th. 12 Sept.	2,196,800	146,800	6·7
*Th. 24 Jan.	2,166,000	223,300	10·3
Th. 24 Oct.	2,161,700	177,300	8·2
M. 27 May	2,145,900	176,900	8·2
W. 18 Sept.	2,145,700	180,400	8·4
W. 11 Dec.	2,137,600	179,000	8·4
Th. 26 Sept.	2,125,000	150,600	7·1
†Th. 30 May	2,088,700	149,700	7·2
Th. 9 May	2,082,200	108,000	5·2
Th. 21 Feb.	2,047,300	177,000	8·6
W. 18 Dec.	2,032,900	144,100	7·1
*Th. 5 Sept.	2,027,700	225,200	11·0
Th. 10 Oct.	2,022,200	181,500	9·0
Th. 26 Dec.	1,980,000	148,900	7·5
*Th. 13 June	1,972,300	241,200	12·3
Th. 21 Nov.	1,932,900	126,700	6·6
Th. 19 Sept.	1,815,800	156,900	8·6
Th. 3 Jan.	1,797,700	140,600	7·8
*Th. 20 June‡	1,773,200	193,700	10·9
Th. 6 June	1,760,200	151,800	8·6
*W. 2 Jan.	1,694,200	184,300	10·9
Th. 27 June	1,651,900	154,700	9·4
W. 1 May	1,591,200	158,200	9·9
W. 26 June	1,529,700	140,000	9·1
Average	2,006,800	169,600	8·45

† Bank discount 5 per cent.
‡ ,, ,, 5½ ,,

Table IV.

The 30 largest Per-Centages of Bank Notes in the Clearings of 1839.

N.B.—Those 7 marked thus (*) occur in Table III. amongst the 30 smallest clearings. *None* occur amongst the 30 largest clearings in Table II.

Days of the Week.	No. of Occur.
Monday	7
Tuesday	3
Wednesday	8
Thursday	9
Friday	3
Saturday	....
	30

Day of Month.	No. of Occur.
1	2
2	2
3	2
5	1
6	1
9	2
10	1
11	2
13	2
14	1
16	1
20	1
21	2
22	2
24	2
25	3
27	2
30	1

Months.	No. of Occur.
January	6
February	1
March	3
April	3
May	1
June	4
July	3
August	2
September	3
October	....
November	1
December	3
	30

Date.	Clearing.	Bank Notes.	Clearing Per Cent.
M. 30 Dec.	2,659,200	255,500	9·6
M. 3 June	2,327,300	223,800	9·6
Th. 22 Aug.	2,352,500	230,600	9·8
F. 27 Dec.	2,275,200	223,400	9·8
M. 2 Dec.	2,373,900	235,000	9·9
*W. 1 May	1,591,200	158,200	10·0
Tu. 16 July	2,921,600	296,000	10·1
W. 25 Sept.	2,437,700	245,700	10·1
*W. 24 April	2,212,000	227,200	10·3
*Th. 24 Jan.	2,166,000	223,300	10·3
Tu. 9 July	3,585,600	373,000	10·4
M. 21 Jan.	2,942,300	305,400	10·4
M. 22 April	2,880,300	302,600	10·5
Th. 25 July	2,464,600	258,200	10·5
W. 13 Mar.	2,410,000	256,300	10·6
F. 1 Nov.	2,311,100	246,400	10·7
*Th. 20 June	1,773,200	193,700	10·9
W. 2 Jan.	1,694,200	184,300	10·9
M. 14 Jan.	2,857,200	313,800	11·0
Tu. 11 June	2,847,200	313,000	11·0
F. 27 Sept.	2,812,300	312,300	11·1
M. 25 Feb.	2,535,800	282,200	11·1
*Th. 5 Sept.	2,027,700	225,200	11·1
W. 3 April	2,650,600	303,600	11·4
Th. 21 Mar.	2,568,800	296,700	11·6
Th. 11 Aug.	3,157,100	376,400	11·9
*Th. 13 June	1,972,300	241,200	12·2
W. 6 Mar.	2,344,000	294,400	12·6
Th. 10 Jan.	2,692,200	373,300	13·9
W. 9 Jan.	3,238,200	593,300	18·3

Three are greater than 3,000,000.

TABLE V.

The 30 smallest Per-Centages of Bank Notes in the Clearings of 1839.

Eleven of these occur amongst the 30 largest clearings in Table II. marked *. *None* amongst the 30 smallest clearings in Table III.

Days of the Week.	No. of Occur.
Monday	3
Tuesday	3
Wednesday	4
Thursday	4
Friday	5
Saturday	11
	30

Day of Month.	No. of Occur.
1	1
2	1
5	1
6	3
7	1
9	1
13	1
14	1
15	2
16	3
17	1
18	1
19	1
20	1
22	2
27	2
29	1
30	4
31	2
	30

Months.	No. of Occur.
January	2
February	4
March	1
April	5
May	1
June	2
July	2
August	3
September	1
October	2
November	5
December	2
	30

	Date.	Clearing.	Bank Notes.	Clearing Per Cent.
	S. 6 July	3,854,700	132,900	3·5
*FS	Tu. 30 April	4,316,400	166,400	3·8
FS	Th. 16 May	3,530,300	134,700	3·8
*	S. 6 April	4,591,000	189,800	4·1
	W. 6 Feb.	2,658,400	109,100	4·1
*FS	F. 15 Nov.	4,883,200	204,600	4·2
*ES	W. 27 Nov.	4,253,000	178,500	4·2
	S. 22 June	3,313,700	138,500	4·2
*	S. 2 Mar.	4,653,000	199,600	4·3
*ES	Tu. 15 Oct.	6,209,900	271,300	4·4
	W. 20 Nov.	2,484,200	110,300	4·4
*FS	F. 30 Aug.	4,587,400	208,200	4·5
*FS	Th. 14 Feb.	4,018,800	181,200	4·5
*FS	M. 30 Sept.	5,087,500	232,900	4·6
	S. 7 Dec.	3,723,600	171,000	4·6
	F. 9 Aug.	3,141,800	143,200	4·6
	S. 16 Feb.	3,432,600	162,500	4·7
	F. 19 April	3,317,200	157,600	4·7
	M. 18 Nov.	2,781,100	130,900	4·7
	F. 22 Feb.	2,499,400	118,100	4·7
	Tu. 17 Dec.	3,140,000	146,400	4·7
*FS	Th. 31st Oct.	4,533,000	219,100	4·8
	S. 13 April	3,930,400	189,900	4·8
FS	Th. 31 Jan.	3,670,400	176,900	4·8
	S. 5 Jan.	3,373,000	161,400	4·8
*FS	W. 16 Oct.	4,730,000	232,000	4·9
	S. 1 June	3,523,800	171,000	4·9
	S. 30 Nov.	3,486,200	171,900	4·9
	M. 29 April	2,730,100	134,000	4·9
	S. 27 July	3,450,300	172,100	5·0

Five are less than 3,000,000.

TABLE VI.

Averages for every same day of the Month.

TABLE VII.

Averages for those same days of the month which have neither IB, ES, *nor* FS.

Days of the Month.	Curve D, pl. 3. Average of *every* day.	Curve D_2 pl. 3. Average Bank Notes every day.	Curve D_1 pl. 3. Per Centages	Number of Days.	Curve D, pl. 3. Average excepting IB, ES, FS.	Curve D_2 pl. 3. Bank Notes to preceding.	Curve D_1 pl. 3. Per Centages	Number of Days.
1....	2,794,600	201,450	7·21	10	2,794,600	201,450	7·21	10
2....	3,182,000	202,800	6·38	11	3,182,000	202,800	6·38	11
3....	2,936,400	216,900	7·40	9	2,734,100	207,650	7·61	8
4....	4,050,000	269,200	6·65	11	None	None	None	None
5....	2,984,300	206,100	6·92	11	2,984,300	206,100	6·92	11
6....	2,991,000	190,600	6·37	10	2,991,000	190,600	6·37	10
7....	2,962,600	192,800	6·52	10	2,962,600	192,800	6·52	10
8....	2,991,000	211,400	7·07	10	2,991,000	211,400	7·07	10
9....	3,009,500	235,700	7·86	11	3,009,500	235,700	7·86	11
10....	2,869,200	221,400	7·67	9	2,869,200	221,400	7·67	9
11....	2,996,800	231,950	7·73	11	2,412,300	223,050	9·32	10
12....	3,111,600	207,600	6·68	11	3,111,600	207,600	6·68	11
13....	2,948,700	218,200	7·40	10	2,948,700	218,200	7·40	10
14....	3,172,100	232,200	7·33	10	2,946,900	230,100	7·80	7
15....	3,969,300	244,200	6·15	10	2,927,500	227,050	7·75	4
16....	3,649,800	232,000	6·36	11	3,137,800	234,200	7·46	6
17....	3,109,900	212,600	6·84	9	2,986,250	199,500	6·67	8
18....	2,839,800	193,800	6·83	11	2,839,800	193,800	6·83	11
19....	2,865,100	194,400	6·80	11	2,865,100	194,400	6·80	11
20....	2,655,400	175,500	6·60	10	2,655,400	175,500	6·60	10
21....	2,728,000	208,150	7·62	10	2,728,000	208,150	7·62	10
22....	2,857,300	202,600	7·08	10	2,857,300	202,600	7·08	10
23....	3,042,600	194,300	6·39	11	3,042,600	194,300	6·39	11
24....	2,618,800	219,700	8·38	9	2,618,800	219,700	8·38	9
25....	2,694,500	219,900	8·18	10	2,694,500	219,900	8·18	10
26....	2,870,800	209,900	7·31	11	2,755,100	205,500	7·44	10
27....	2,846,900	216,100	7·58	10	2,690,700	220,300	8·19	9
28....	3,231,150	213,400	6·60	10	2,743,000	188,600	6·88	6
29....	3,403,500	225,500	6·63	8	2,927,800	193,600	6·61	6
30....	3,384,050	197,100	5·83	10	2,835,600	194,800	6·86	7
31....	3,898,800	208,050	5·38	6	3,708,800	194,000	5·23	1

On the 3rd August IB occurs; on the 11th April ES; on the 14th February, March, and June, FS; on 15th of five months FS, and on the 15th of one other month ES; on the 16th of four months FS, and on the 16th of one other month ES; on the 17th July ES; on the 26th February ES; on the 26th November ES; on the 28th FS occurs three times, ES once; on the 29th FS and ES each once; on 30th FS three times; on the 31st FS five times.

TABLE VIII.

Average Clearing of each Day of the Week during the Year 1839.

	Table VII. Clearing. Curve H, pl. 2.	Table VII. Bank Notes. Curve H_2 pl. 2.	Curve H_1 pl. 2. Bank Notes Per Cent. of Clearing.	Number of Instances.
Mondays	2,927,700	213,700	7·31	52
Tuesdays	3,296,800	238,500	7·11	53
Wednesdays	2,729,400	207,400	7·61	51
Thursdays	2,725,000	200,000	7·32	52
Fridays	3,101,800	211,500	6·58	51
Saturdays	3,621,700	210,700	5·82	52
Average week....	18,402,400	1,281,800	....	311
$\frac{1}{6}$ is	3,067,100	213,600	....	....
Average day	3,068,800	213,100 Table VII.		....

TABLE IX.

Average Clearing of each Day of the Week during the Year 1839, *omitting the days of Inland Bills, English Settlements, and Foreign Settlements.*

	Clearing. Curve H, pl. 2.	Bank Notes. Curve H_2 pl. 2.	Bank Notes Per Cent. of Clearing. Curve H_1 pl. 2.	Number of Instances.
Mondays	2,653,200	205,100	7·71	44
Tuesdays	3,123,200	231,500	7·39	46
Wednesdays	2,514,700	199,000	7·89	44
Thursdays	2,367,400	189,200	8·00	40
Fridays	2,912,900	206,200	7·09	43
Saturdays	3,575,000	207,900	5·81	50
Average week....	17,146,400	1,238,900	....	267

The circumstance that Tuesday, with a larger clearing than Friday, has also a larger per-centage of bank notes, seems to indicate that the average *magnitude* of the bills of Tuesday is larger.

TABLE X.

Average Daily Clearing of each Month during the Year 1839.

	Clearing. Curve C, pl. 3.	Bank Notes. Curve C_2 pl. 3.	Curve C_1 pl. 3. Bank Notes Per Cent. of Clearing.	Number of Instances.
January	3,065,300	235,100	7·66	27
February	3,173,500	206,700	6·52	24
March	3,135,200	224,900	7·16	25
April	3,301,500	224,500	6·80	26
May	2,984,700	208,000	6·98	27
June	2,696,600	202,400	7·50	25
July	3,106,100	232,800	7·49	27
August	3,244,800	228,300	7·05	27
September	2,969,500	205,200	6·91	25
October	3,240,000	211,400	6·53	27
November	3,143,400	184,400	5·87	26
December	2,833,400	190,200	6·72	25
				311

TABLE XI.

Average Daily Clearing of each Month during the Year 1839, *omitting the days of Inland Bills, English Settlements, and Foreign Settlements.*

	Clearing.*	Bank Notes.	Bank Notes Per Cent. of Clearing.	Number of Instances.
January	2,902,300	233,000	8·04	23
February	2,971,100	199,400	6·71	20
March	2,885,200	217,600	7·53	22
April	3,147,900	221,200	7·02	22
May	2,778,900	202,900	7·30	23
June	2,530,400	191,500	7·57	22
July	2,999,200	229,800	7·66	23
August	3,024,200	217,600	7·21	23
September	2,753,200	197,900	7·19	22
October	2,952,800	205,600	6·97	23
November	2,942,800	179,500	6·11	22
December	2,701,000	183,500	6·80	22
				267

* Curve C, pl. 3.

TABLE XII.

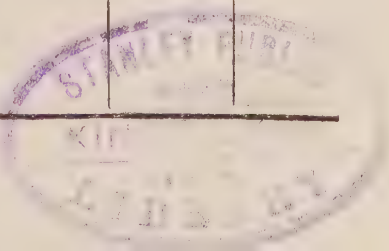
Average Daily Clearance of each Week during the Year 1839.

Weeks of the Years.	Included.	Curve B, pl. 2. Aggregate Demands.	Curve B_2 pl. 2. Bank Notes.	Curve B_1 pl. 2. Clearing Per Cent.	Weeks of the Years.	Included.	Curve B, pl. 2. Aggregate Demands.	Curve B_2 pl. 2. Bank Notes.	Curve B pl. 2. Clearing Per Cent.
Jan.					July				
1	IB	2,610,800	188,400	7·22	28		3,333,200	277,200	8·33
2	....	3,178,400	305,100	9·60	29	{ES FS}	3,391,600	243,700	7·20
3	{ES FS}	3,586,800	249,000	6·94	30	....	2,820,900	202,400	7·18
4	....	2,899,100	226,900	7·82	Aug.				
5	FS	3,070,700	199,000	6·50	31	{IB FS}	3,247,400	230,700	7·10
Feb.					32	....	3,092,800	194,200	6·29
6	IB	3,397,000	207,700	6·11	33	FS	3,242,200	237,000	7·32
7	FS	3,204,900	211,800	6·62	34	....	2,832,600	211,000	7·46
8	....	2,828,500	173,300	6·12	35	{ES FS}	3,739,200	269,600	7·21
9	{ES FS}	3,520,400	219,700	6·24	Sep.				
Mar.					36	IB	2,938,900	222,800	7·58
10	IB	3,066,800	242,900	7·91	37	....	2,735,900	179,200	6·54
11	FS	2,878,400	247,900	8·61	38	FS	3,019,000	198,600	6·58
12	....	2,675,900	209,900	7·83	39	....	2,831,200	232,200	8·20
13	FS	3,182,200	205,700	6·47	Oct.				
April					40	{FS IB}	3,412,800	202,500	5·94
14	IB	3,198,600	217,000	6·79	41	....	2,829,100	204,900	7·24
15	ES	3,503,600	241,900	6·91	42	{ES FS}	4,074,500	236,100	5·79
16	FS	3,497,200	231,800	6·62	43	....	2,994,700	213,700	7·15
17	....	2,932,700	231,900	7·92	Nov.				
May					44	FS	3,132,800	208,600	6·67
18	{FS IB}	3,307,600	193,000	5·83	45	IB	3,158,400	196,400	6·21
19	....	3,013,000	190,800	6·34	46	FS	3,386,500	183,100	5·40
20	FS	3,050,800	212,300	6·97	47	....	2,734,800	152,500	5·58
21	....	2,695,400	215,700	8·00					
22	{ES FS}	3,126,100	202,500	6·47	48	{ES FS}	3,325,600	191,100	5·74
June					Dec. 49	IB	3,295,500	220,600	6·69
23	IB	2,881,000	214,800	7·46	50	....	2,565,900	177,600	6·91
24	FS	2,711,000	227,500	8·40	51	FS	2,837,700	167,600	5·90
25	....	2,507,300	177,600	7·08	52	....	2,467,400	151,100	6·12
26	FS	2,549,000	194,900	7·65	53	FS	3,150,700	226,500	7·19
July									
27	IB	2,878,900	209,200	7·27	Annl.	Avg.	3,064,900	212,200	6·94

TABLE XIII.

Average Daily Clearing of each Week during the Year 1839, *omitting the days of Inland Bills, English Settlements, and Foreign Settlements.*

Weeks of the Year.	Omitted.	Curve B, pl. 2. Aggregate Demands.	Bank Notes.	Clearing Per Cent.	Weeks of the Year.	Omitted.	Aggregate Demands.	Bank Notes.	Clearing Per Cent.
Jan.					July				
1	IB	2,354,000	172,000	7·32	28	....	3,333,200	277,200	8·33
2	....	3,178,400	305,100	9·60	29	ES, FS	3,022,500	226,900	7·51
3	ES, FS	3,208,400	238,600	7·43	30	....	2,820,900	202,400	7·18
4	....	2,899,100	226,900	7·82	Aug.				
5	FS	2,950,800	203,400	6·90	31	IB, FS	2,852,200	216,400	7·59
Feb.					32	....	3,092,800	194,200	6·29
6	IB	3,054,800	182,900	6·00	33	FS	3,161,800	227,400	7·20
7	FS	3,042,200	217,900	7·17	34	....	2,832,600	211,000	7·46
8	....	2,828,500	173,300	6·12	35	ES, FS	3,144,900	258,300	8·22
9	ES, FS	3,376,800	214,700	6·35	Sep.				
Mar.					36	IB	2,762,700	188,300	6·82
10	IB	2,821,900	288,100	10·22	37	....	2,735,900	179,200	6·54
11	FS	2,720,700	242,700	8·93	38	FS	2,671,000	188,600	7·07
12	....	2,675,900	209,900	7·83	39	....	2,831,200	232,200	8·20
13	FS	2,866,000	196,200	6·84	Oct.				
April					40	FS, IB	2,824,700	181,600	6·44
14	IB	3,099,600	220,900	7·12	41	....	2,829,100	204,900	7·24
15	ES	3,435,900	226,100	6·58	42	ES, FS	3,376,700	182,700	5·41
16	FS	3,249,800	221,100	6·80	43	....	2,994,700	213,700	7·15
17	....	2,932,700	231,900	7·92	Nov.				
May					44	FS	2,852,700	206,500	7·25
18	FS, IB	2,625,900	179,900	6·84	45	IB	3,098,600	196,700	6·36
19	....	3,013,000	190,800	6·34	46	FS	3,087,200	177,000	5·73
20	FS	2,954,900	227,900	7·72	47	....	2,734,800	152,500	5·58
21	....	2,695,400	215,700	8·00					
22	ES, FS	2,660,100	168,400	6·33	48	ES, FS	2,826,800	175,300	6·20
June					Dec. 49	IB	3,193,900	208,900	6·55
23	IB	2,553,500	188,700	7·40	50	....	2,565,900	177,600	6·91
24	FS	2,651,900	221,800	8·37	51	FS	2,612,100	152,800	5·86
25	....	2,507,300	177,600	7·08	52	....	2,467,400	151,100	6·12
26	FS	2,294,900	185,000	8·08	53	FS	2,659,200	255,500	9·59
July									
27	IB	2,834,000	207,400	7·33					



INLAND BILLS.

Table XIV.

Clearings on day when Inland Bills are due. Tables I. and VI.

Days of Inland Bills being due.	See Curve 1, 1_1. Plate 2. Clearings,	Bank Notes.	Per Cent.
4 Jan. F.	3,637,900	254,200	6·71
4 Feb. M.	5,107,900	331,700	6·50
4 Mar. M.	4,291,300	317,100	7·39
4 April Th.	3,693,500	197,400	5·35
4 May S.....	5,025,800	272,200	5·31
4 June Tu.	4,518,300	345,500	7·64
4 July Th.	3,103,300	218,100	7·04
3 Aug. S.....	4,554,500	291,000	6·40
4 Sept. W.	3,820,100	295,300	7·73
4 Oct. F.....	4,090,600	255,600	6·25
4 Nov. M.	3,457,600	194,900	5·63
4 Dec. W.	3,804,000	279,500	7·35
Average.....	4,092,100	271,040	6·61

Table XV.

Clearing on the Day of Settlement at the English Stock Exchange.

Days of Settlement.	Clearings. See Curve E. Plate 2.	Bank Notes.	Per Cent.
16 Jan. W.....	4,336,300	288,700	6·65
26 Feb. Tu.....	4,027,700	253,700	6·30
11 April Th.....	3,842,000	321,000	8·36
28 May Tu.....	3,999,400	308,200	7·72
17 July W.....	4,099,200	317,500	7·75
29 Aug. Th.....	5,267,800	375,900	7·13
15 Oct. Tu.....	6,209,900	271,300	4·37
27 Nov. W.....	4,253,000	178,500	4·20
Average.....	4,504,400	289,350	6·42

Table XVI.

Clearings on the Days of Settlement at the Foreign Stock Exchange.

Days of Settlement.	Clearings. See Curve F. Plate 2.	Bank Notes.	Bank Notes Per Cent.
15 Jan. Tu.	4,351,100	250,900	5·77
31 ,, Th.	3,670,400	176,900	4·82
14 Feb. Th.	4,018,800	181,200	4·50
28 ,, Th.	3,587,700	205,800	5·73
14 Mar. Th.	3,666,900	273,900	7·46
28 ,, Th.	4,447,000	243,700	5·48
15 April M.	4,734,500	285,300	6·04
30 ,. Tu.	4,316,400	166,400	3·85
16 May Th.	3,530,300	134,700	3·82
31 ,, F.	4,117,200	233,200	5·66
14 June F.	3,406,700	256,200	7·51
28 ,, F.	3,819,400	244,500	6·40
15 July M.	4,160,300	237,100	5·70
31 ,, W.	3,521,200	227,500	6·47
15 Aug. Th.	3,644,000	284,800	7·82
30 ,, F.	4,587,400	208,200	4·54
16 Sept. M.	4,758,700	249,000	5·24
30 ,, M.	5,087,500	232,900	4·57
16 Oct. W.	4,730,000	232,000	4·91
31 ,, Th.	4,533,300	219,100	4·84
15 Nov. F.	4,883,200	204,600	4·19
29 ,, F.	4,393,400	266,800	6·08
16 Dec. M.	3,965,800	241,900	6·10
31 ,, Tu.	3,642,200	197,600	5·43
Average	4,148,900	227,250	5·66

Table XVII.

Amount of Inland Bills.

Date.	Day of the Week.	Mean of *same* day of week before and ditto of week after.	Deduced from the *whole week in which* disturbance occurs.
4 January	F.	920,600	....
4 February	M.	2,277,400	2,266,900
4 March	M.	1,766,950	1,667,000
4 April.....	Th.	584,650	1,182,800
4 May	S.	1,467,800	1,424,500
4 June	Tu.	1,583,050	1,709,200
4 July	Th.	420,800	807,700
3 August	S.	901,150	854,300
4 September ..	W.	1,267,700	1,471,800
4 October	F.	1,157,000	1,265,900
4 November....	M.	754,050	575,900
4 December....	W.	1,493,100	1,089,200
Average.....	....	1,216,188	1,192,930

TABLE XVIII.

Amount of English Stock.

Date.	Day of the Week.	Curve E, pl. 2. Mean of *same* day of week before and ditto of week after. From Table X.	Curve E_2, pl. 3. Deduced from the *whole week in which* disturbance occurs.
16 January	W.	1,403,600	1,570,400
26 February ..	Tu.	817,050	448,900
11 April	Th.	733,150	1,058,900
28 May	Tu.	1,371,500	1,054,300
17 July	W.	1,497,100	1,580,500
29 August	Th.	3,077,700	2,730,700
15 October	Tu.	2,866,550	2,600,300
27 November..	W.	1,108,900	1,857,400
Average.....	....	1,609,450	1,612,680

TABLE XIX.

Amount of Foreign Stock.

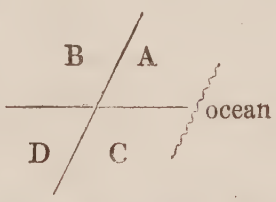
Date.	Day of the Week.	Mean of *same* day of week before and week after. From Table XI.	Deduced from the *whole week in which* disturbance occurs.
15 January	Tu.	1,010,150	921,400
31 ,,	Th.	1,323,000	1,280,200
14 February ..	Th.	1,730,750	1,554,600
28 ,,	Th.	1,392,450	817,000
14 March.....	Th.	1,210,900	1,163,100
28 ,,	Th.	1,315,850	2,589,800
15 April	M.	1,669,800	1,712,200
30 ,,	Tu.	1,005,050	1,215,300
16 May	Th.	1,387,550	1,136,800
31 ,,	F.	1,422,500	1,362,100
14 June	F.	874,550	363,100
28 ,,	F.	1,250,850	1,491,000
15 July	M.	1,551,400	1,440,000
31 ,,	W.	913,050	951,600
15 August	Th.	1,344,700	1,082,900
30 ,,	F.	1,713,200	1,521,700
16 September.	M.	1,999,950	2,274,700
30 ,,	M.	2,202,400	2,457.600
16 October	W.	1,991,250	1,819,000
31 ,,	Th.	2,113,550	2,222,300
15 November	F.	2,043,150	1,749,700
29 ,,	F.	1,471,200	1,614,500
16 December	M.	1,523,400	1,536,600
Average.....	....	1,498,289	1,481,617

On the Distribution of the Emigrants from Europe over the surface of the United States. By The Reverend Robert Everest.

[Read before the Statistical Society, on Monday the 21st of May, 1855.]

In a former paper* I pointed out the greater and less tendencies to crime and pauperism among the natives of the different countries of Europe, resident in the United States, as shewn in tables drawn up from the reports of prisons and almshouses (see Tables D 1, E, and D 3, of the paper), and endeavoured to account for the phenomena by differences of national character, attributable to institutions. The numbers given in the tables were too small to render the results conclusive, and it would be out of place in this Society to strengthen the argument by the testimonies of travellers, such as that of the celebrated John Howard, in his work on the prisons of Europe, respecting Switzerland and Holland. We may, however, confirm our former deductions, numerically, by attending to the following considerations:—

The United States, in different parts of their territory, offer very different advantages and disadvantages to a settler. Referring to the map, we find, as was before observed, that the United States are divided by an irregular line, running nearly east and west, into what are called the Free States and the Slave States; and another line might be traced, crossing this, and running nearly north and south, which would be the boundary between the old States on the borders of the Atlantic, and the new ones in the interior of the country. It is true there are two new States, Florida and Alabama, resting upon the Atlantic and the Gulf of Mexico, but for the purpose of our present argument, it will be sufficient to describe the whole surface, as divided by two intersecting lines into four parts, or quarters, thus:—



where A represents the old free States, and B the new free States; C the old slave States, and D the new slave States.

In the first two of these, A and B, labour, as I have elsewhere observed, is not degrading, in the third and fourth it is so.

In the old States, A and C, there are to be found most of the conveniences and comforts of Europe, large and wealthy cities (New York may be reckoned the third city in the world), and a rate of wages high in comparison with what obtains in older countries. But the land, at least most of it worth having, is cleared and settled, and the working man finds much greater difficulty in rising to wealth, and even to independence, than he would in the new States. There the demand for labour is so great, that one man can hardly be got to work for another. I was informed by a person, who had settled in

* *Quarterly Journal of the Statistical Society*, vol. xviii., p. 222.

a new tract of country, that he obtained a farm for himself by assisting another man for a year, and, though he had arrived at the spot with but one dollar in his pocket, at the end of twenty years he found himself in possession of 40,000, not by any extraordinary run of luck, but by the mere increase in the value of land and agricultural produce from the influx of new settlers.

But the whole of life in such places is a self-sacrifice. It requires a firm and resolute will to brave the solitude. There is not the social intercourse to be found in the large cities, the cheap drink shops, the theatres, and shows, and the many other amusements and comforts that solace the lot of the labourer.

The question then for our consideration is—what are the institutions which tend to form, in the greatest numbers, those provident and self-denying characters who readily resign the pleasures of life, and reckon it a prize dearer than all others, to obtain their independence?

In a former paper it was observed, that in those States where power rests with the people, the influential classes labour most assiduously in forming them to principles of morals, intelligence and industry, and, in their anxiety, they take the pains to do so by the most efficacious of all methods, the force of their own example. Like the manufacturer under free trade, their very sense of insecurity serves them instead of protection.

But in countries where the people are deprived of power, it is not the interest of the ruling body that they should be too intelligent, still less that they should obtain that peculiar kind of training which has lately been termed "the cultivation of the judgment." It may be desirable that they should be industrious, and skilful in getting money, but the more easy they are to part with it, the better. The object then, is not to make them thinking and provident, but rather to lead them astray with music and pageants, and to encourage them to leave all serious matters to their superiors. The advice to Cyrus to prevent the conquered Lydians from being troublesome, by giving them music, and theatres, and wine shops, and the "*panem et circenses*" of the Roman Emperors, are well-known cases in point.

Where, too, social position is fixed, wholly or principally, by the circumstance of birth, so that men have neither esteem and respect to hope for, nor disgrace to fear, the degraded class, and indeed every other, are tempted to pursue, as the only good within reach, the sensual indulgence of the moment.

Referring now to the diagram above described, we should naturally suppose that they who would, for the advantages of large cities, the social intercourse, the drink-shops, the theatres, the shows, accept a lower rate of wages, and abandon, if they ever had it, the hope of independence, would settle in the parts A and C, while those who would sacrifice the enjoyments of life for that same hope of independence, would be found in the greatest numbers in the new States, B and D.

Now the late American Census (1850) has given us the numbers of each European nation resident in each State of the Union, and from this I found the number of each, resident in each quarter or group of States, and from these again, the whole. Supposing this

whole to be divided into 100,000 parts, I obtained the proportion of each nation resident in each quarter, and set it down in four columns, marked A, B, C, D (See Table I.).

Taking the sum of the first and third columns (A + C), and of the second and fourth (B + D), the proportion of those who hang about great cities, and of those who go out into the wilds to earn their independence, was also obtained. Now, if we compare this list with those given in a previous paper of criminals and paupers (See pages 15, 16, 17, 18, D 1, D 3, E), we find the results agree tolerably well with the supposition that the natives of those countries who have the least tendency to crime and pauperism, are also those who will make the greatest sacrifices for wealth and independence. The present list differs from the previous ones in some respects. Of course the native Americans are excluded. Sweden and Denmark are here given separately; and Russia, which before was omitted on account of the smallness of its numbers, is inserted. Norway, Switzerland, and Holland, which give the smallest proportions to the alms-houses and prisons, send the greatest proportions to the new States, and the least to the old ones. Ireland, Italy, Spain, and Portugal, appear to occupy, in each case, the opposite end of the scale. British America takes place with the monarchical countries of Europe, which is the more remarkable, as from the rural habits of its scattered population, they might be expected to settle in the greatest numbers in the new states. (Compare Table D 1, of previous paper.)

But besides the division into old States and new States, there is, as we have before observed, another into free and slave States. As this is also a division into north and south, we must endeavour to make some allowance for climate, before ascertaining the proportions of each nation, which, by settling in either the one or the other, indicate their sensitiveness on the subject of degradation, and their aversion to slavery, or the contrary. For in a country which extends from lat. 49° N. to 30°, the natives of the shores of the Baltic could not be expected to settle in such large proportions in the southern parts of it, as those who came from the extreme south of Europe. Nature has made them physically unfit for such a change.

Adding then together the proportions in the same column (Table I.), for the two nations in the extreme north of Europe, and two in the south which differ least in institutions (Russia and Denmark, Spain and Portugal, and Italy), I obtained a mean correction suitable for each case, and this correction was afterwards applied to the two other nations of the Baltic (Norway and Sweden) and British America.

But as identity of origin, including language and religion, would have great effect in determining many, such as the French and Swiss to Louisiana, and the Hollanders to New York, I further corrected the list, by giving for them in these two states the same proportion to the rest of the groups C and A, respectively, as existed for the Germans, with whom there was no identity of language.

The corrected lists may be seen in Tables II. and III. In the latter, besides the proportions of those who settle in the old States and in the new (A + C) and (B + D) (Table I.), there is given (A + B and

C+D) the proportions of those who settle in the free and in the slave States, and which may be supposed to indicate the prevalence of a feeling of aversion to slavery, and sensitiveness to degradation, or the reverse.

Some other causes of disturbance, which have not been allowed for, may yet be mentioned.

British America, which has been corrected for difference of climate, should yet be further reduced in columns A and B, for contiguity of position. An individual from this part of the world has not to quit friends and home for ever, but merely to be ferried across a lake or river, to enter the northern States of the Union.

It will be observed, that the proportions of the natives of the United Kingdom, England, Scotland, Wales, and Ireland, in column A+B are extremely large, but we must remember that a religious feeling of aversion to slavery has been aroused there, within the present century, that did not before exist. Not to mention that slavery, under the names of villainage and serfage, was part of the ancient British constitution, and that some sovereigns, such as Queen Elizabeth and Queen Anne, participated in the profits of the slave trade; even so late as 1792, the House of Lords resisted the abolition of that very slave trade which is now declared piracy, and got it deferred for ten years.

We must also remember, that of the natives of the United Kingdom who go to North America, not more than 79 per cent. enter the United States. These may be supposed to be the most sensitive on the subject of degradation. If we were to include 21 per cent. more in the comparison, the ratio of 80 or 90 to 100, which is nearly that in column A+B, would be altered from 80 or 90 to 125 nearly.

There are some further irregularities in the lists, probably proceeding from smallness of numbers, or other causes. I have, therefore, added (Table IV.) the sum of the two tendencies, and their opposites. These may be expressed thus:—(A+B)+(B+D) and (C+D)+(A+C), or A+2B+D and A+2C+D. By taking away the parts common to both, there remain B and C for the sum of the two opposite tendencies.—See Table V.

Corrections.

The corrections were thus obtained. The mean of the numbers in column A under the heads of Prussia, Denmark, Spain and Portugal, and Italy, was taken, and from this a mean difference was obtained for each of the four numbers. The same process was gone through with the numbers for the same places in column B. The sum of the two mean differences was then taken, and divided proportionately to the numbers in columns A and B (so as not to alter the ratio existing between them), and then added or subtracted from each, as the case might be. The same mean difference was also applied to the numbers for Norway, Sweden, and British America. A similar process was gone through, with respect to the numbers for the same places in columns C and D.

The method for correcting the numbers for France, Switzerland, and Holland, has been described in the body of the paper.

Groups of States.

A.	B.	C.	D.
Maine	Michigan	Delaware	Alabama
New Hampshire	Wisconsin	Maryland	Florida
Vermont	Iowa	Virginia	Mississippi
Massachusetts	Ohio	North Carolina	Tennessee
Rhode Island	Indiana	South Carolina	Kentucky
Connecticut	Illinois	Georgia	Missouri
New York		Louisiana	Arkansas
New Jersey		Dist. of Columbia	Texas
Pennsylvania			

We have now further to say a few words on the migration of the citizens of the United States, from one part of their territory to another.

The Census of 1850 has given us an account of the number of natives of each State in the Union, resident in each of the other States. From this I have compiled the subjoined table, in which the States have been separated into groups, somewhat smaller than those of the first part of this paper. The old free States, there marked A, have been subdivided into two, which have been termed the New England and the New York groups, and the new free States also into two, which I have called the Michigan and Ohio groups. The old slave States have been subdivided into two, termed the Delaware and South Carolina groups, and the new slave States into three, the Tennessee, Alabama, and Texas groups.

Taking the first of these, the New England group, we find that 414,064 of its natives have migrated to the other free States, and but 25,832 to the slave States. Supposing the whole migration to equal 100,000, that to the free States will be represented by 94,128, and to the slave States by 5,872, numbers which would place it with Holland and Wales.—See Table III., columns A+B and C+D.

Let us next examine the second subdivision of the States marked A, which I have called the New York group.

The total amount of its migration to the other Free States has been	796,168
To the Slave States	90,860
Total migration	887,028
Proportion to the Free States	89,757
,, Slave States	10,243
Total	100,000

In this case, the greater percentage of migration to the slave States has probably arisen from their greater proximity.

Bordering upon this New York group, to the south, lie the slave States which I have termed the Delaware group; and the contrast between the two is remarkable. While the former has sent across the boundary line, into the slave States, only 10·243 per cent. of its total migration, the latter has sent no less than 45·180 per cent. into the free States, nearly four and a half times as much, so that the

objection to crossing this line of demarcation only holds when the crossing is in a particular direction.

This will be the more clear when we compare the amount of migration which each of the above groups has sent to the two groups of new States, immediately to the west, which I have termed the Ohio (free), and the Tennessee (slave). In this case the difference in contiguity of position, and in climate, is but small.

	To the Ohio Group.		To the Tennessee Group.
The New York group, then, has sent, persons	496,544	....	29,250
The Delaware group has sent.....	267,184	....	259,429

or, in proportions of the total migration of each,

	To the Ohio Group.		To the Tennessee Group.
The New York group.....	55,978	....	3,712
The Delaware group	34,944	....	33,928

But we know something more, beyond the mere fact that so many people migrated from the slave States to the free; we also know that they were poor, or working people; for, though the slave owner may reclaim his fugitive slaves from a free State, yet if he voluntarily take them with him into a free State, they become free by law forthwith.

Summing up the whole, we find that 116,692 persons have left the old free States to reside in the slave States, and 365,328 have left the old slave States to reside in the free. The difference or loss to the slave States being 248,636.

We are now enabled to answer the question, so often asked: How is it that the slave States do not prosper? "Somehow they do not prosper," is the answer of every one. They are shunned by the free citizens of the north; and the emigrants from Europe, in search of a resting place, pass them by. Moreover, a large portion of their native population desert them, to seek beyond the boundary line an asylum.

Note.—The migration from the New States has not been taken into the account. It is trifling, and would not affect the general deductions.

TABLE I.

Showing the Numbers of the Natives of each country of Europe, resident in the Four Divisions of the United States, marked A, B, C, D.

Uncorrected List.

Natives of	Numbers.				Proportions.			
	A.	B.	C.	D.	A.	B.	C.	D.
England	165,475	83,195	13,643	11,922	60,341	30,337	4,975	4,347
Ireland.....	722,535	131,493	68,972	35,202	75,405	13,723	7,198	3,674
Scotland	42,390	17,834	5,563	3,474	61,203	25,749	8,032	5,016
Wales	17,133	11,388	548	480	57,982	38,539	1,855	1,624
Germany	217,684	235,562	55,975	71,587	37,480	40,558	9,637	12,325
France	18,998	15,152	13,027	5,233	36,248	28,912	24,856	9,984
Spain and Portugal	1,555	185	1,806	501	38,423	4,571	44,626	12,380
Belgium	612	383	184	110	47,479	29,713	14,274	8,534
Holland	3,715	5,418	316	337	37,962	55,365	3,229	3,444
Italy.....	1,301	263	1,241	633	37,842	7,650	36,096	18,412
Switzerland	3,125	7,187	991	1,836	23,784	54,700	7,542	13,974
Russia	823	254	134	145	60,693	18,732	9,882	10,693
Norway	540	11,573	92	307	4,316	92,495	735	2,454
Sweden	1,270	1,529	378	212	37,474	45,117	11,154	6,255
Denmark....	816	334	399	189	46,951	19,217	22,957	10,875
British America	99,289	42,498	1,197	1,807	68,574	29,351	827	1,248

Proportions of each Resident.

Natives of	In the Old States. (A + C.)	In the New States. (B + D.)
1. Norway	5,051	94,949
2. Switzerland	31,326	68,674
3. Holland	41,191	58,809
4. Germany	47,117	52,883
5. Sweden.....	48,628	51,372
6. Wales	59,837	40,163
7. France	61,104	38,896
8. Belgium	61,753	38,247
9. England	65,316	34,684
10. Scotland	69,235	30,765
11. British America	69,401	30,599
12. Denmark	69,908	30,092
13. Russia	70,575	29,425
14. Italy.....	73,928	26,062
15. Ireland.....	82,603	17,397
16. Spain and Portugal	83,049	16,951

N.B.—California and the Territories have not been taken into consideration.

TABLE II.

Corrected List.—Proportions.

	A.	B.	C.	D.
Norway	3,689	79,876	4,107	13,814
Holland	22,800	68,896	4,018	4,286
Switzerland	24,914	57,299	3,149	14,638
Sweden	30,889	37,456	20,529	11,512
Denmark	36,823	15,109	32,915	15,549
Germany	37,480	40,558	9,637	12,325
France	45,712	36,428	5,238	12,592
Belgium	47,479	29,713	14,274	8,534
Italy	49,693	10,045	26,406	13,470
Russia	49,809	15,374	15,909	18,298
Spain and Portugal	51,154	6,806	33,154	9,220
Wales	57,982	38,539	1,855	6,624
British America	58,599	25,080	6,273	10,434
England	60,341	30,337	4,975	4,347
Scotland	61,203	25,749	8,032	5,016
Ireland	75,405	13,723	7,198	3,674

TABLE III.

Corrected List.—Proportions.

	A + C.	B + D.	A + B.	C + D.
1. Norway	7,796	93,690	83,565	17,921
2. Holland	26,818	73,182	91,696	8,304
3. Switzerland	28,063	71,927	82,213	17,787
4. Germany	47,117	52,883	78,038	21,962
5. France	50,950	49,020	82,140	17,830
6. Sweden	51,418	48,968	68,345	32,041
7. Wales	59,837	40,163	96,521	3,479
8. Belgium	61,753	38,247	77,192	22,808
9. British America	64,872	35,514	83,679	16,707
10. England	65,316	34,684	90,678	9,322
11. Russia	65,718	33,672	65,183	34,207
12. Scotland	69,235	30,765	86,952	13,048
13. Denmark	69,738	30,658	51,932	48,464
14. Italy	76,099	23,515	59,738	39,876
15. Ireland	82,603	17,397	89,128	10,872
16. Spain and Portugal	84,308	16,026	57,960	42,374

TABLE IV.

Corrected List.—Proportions.

	A + 2B + D.	A + 2C + D.
1. Denmark	82,590	118,202
2. Italy	83,253	115,975
3. Spain and Portugal	93,986	126,682
4. Russia	98,855	99,925
5. Ireland	106,525	93,475
6. Belgium	115,439	84,561
7. Sweden	117,313	83,459
8. Scotland	117,717	82,283
9. British America	119,193	81,579
10. England	125,362	74,638
11. Germany	130,911	69,079
12. France	131,160	68,760
13. Wales	136,684	63,316
14. Switzerland	154,140	45,850
15. Holland	164,878	35,122
16. Norway	177,255	25,717

TABLE V.

Corrected List.—Proportions.

	B.	C.
1. Spain and Portugal	6,806	33,154
2. Italy	10,045	26,406
3. Ireland	13,723	7,198
4. Denmark	15,109	32,915
5. Russia	15,374	15,909
6. British America	25,080	6,273
7. Scotland	25,749	8,032
8. Belgium	29,713	14,274
9. England	30,337	4,975
10. France	36,428	5,238
11. Sweden	37,456	20,529
12. Wales	38,539	1,855
13. Germany	40,558	9,637
14. Switzerland	57,299	3,149
15. Holland	68,896	4,018
16. Norway	79,876	4,107

TABLE VI.

Showing the Numbers of the Natives of each Group of States, resident in their own or in other Groups.

New Englanders Resident.		Natives of New York Group Resident.		Natives of Delaware Group Resident.		Natives of S. Carolina Group Resident.	
In New England Group	2,367,832	In New York Group	4,566,495	In Delaware Group	2,490,484	In South Carolina Group	874,510
In New York Group	237,367	In New England Group....	47,035	In New York Group	57,153	In New York Group.....	3,120
,, Michigan do.	63,487	,, Michigan do.	252,589	,, New England do.	3,925	,, New England do.....	1,440
,, Ohio do.	113,220	,, Ohio do.	496,544	,, Michigan do.	17,102	,, Michigan do.....	1,546
Total in Free States	414,074	Total in Free States	796,168	,, Ohio do.	267,184	,, Ohio do.....	13,697
In Delaware Group	7,532	In Delaware Group	40,669	Total in Free States	345,364	Total in Free States	19,803
,, South Carolina do.....	6,480	,, South Carolina do.	12,105	In South Carolina Group	61,445	In Delaware States	6,514
,, Tennessee do.....	6,252	,, Tennessee do.	29,250	,, Tennessee do.	259,429	,, Tennessee do.	29,967
,, Alabama do.....	3,720	,, Alabama do.	5,681	,, Alabama do.	74,993	,, Alabama do.	172,191
,, Texas do.....	1,848	,, Texas do.	3,155	,, Texas do.	23,287	,, Texas do.	28,623
Total in Slave States	25,832	Total in Slave States	90,860		419,154	Total in Slave States	237,295
Total migration	439,896	Total migration	887,028	Total migration.....	764,518	Total migration.....	257,098
Proportion of ditto to Free States	94,128	Proportion to Free States	89,757	Proportion of ditto to Free States	45,175	Proportion to Free States	7,702
Do. to Slave States.....	5,872	Do. Slave States	10,243	Do. to Slave States	54,825	Do. Slave States	92,298
Number in Michigan and Ohio Groups	176,707	Do. Ohio Group	55,978	Do. to Ohio Group	34,944		
Proportion	42,676	Do. Tennessee Group	3,712	Do. to Tennessee do.	33,928		
Number in South Carolina and Delaware Group	14,012						
Proportion	3,384						

Total migration from old Free States to Slave States.....	90,860	+ 25,832	= 116,692
Do. from old Slave States to Free States.....	345,444	+ 19,884	= 365,328
Lost to Slave States, and gained by Free States.....	365,528	— 116,692	= 248,636

Names of States composing the several Groups.

FREE.

New England Group:	New York Group:	Michigan Group:	Ohio Group:
Maine	New York	Michigan	Ohio
Vermont	New Jersey	Wisconsin	Indiana
New Hampshire	Pennsylvania	Iowa	Illinois
Massachusetts			
Rhode Island			
Connecticut			

SLAVE.

Delaware Group:	Alabama Group:	Texas Group:
Delaware	Alabama	Texas
Maryland	Florida	Arkansas
Virginia	Mississippi	
District of Columbia		
North Carolina	South Carolina Group:	Tennessee Group:
	South Carolina	Tennessee
	Georgia	Kentucky
	Louisiana	Missouri

California and the Territories have not been taken into consideration.

Reference to the Map.

Division A composed of ..... { 1. New England Group. 2. New York Group.

Division B composed of ..... { 3. Michigan Group. 4. Ohio Group.

Division C composed of ..... { 5. Delaware Group. 6. South Carolina Group.

Division D composed of ..... { 7. Tennessee Group. 8. Alabama Group. 9. Texas Group.

Short Notes of the Prevailing Diseases in the Colony of Sierra Leone, with a Return of the Sick Africans sent to Hospital in Eleven Years, and classified Medical Returns for the Years 1853-4. *Also Tables showing the number of Lunatics admitted to Hospital in a period of Thirteen Years, and the number treated from* 1*st April*, 1842, *to* 31*st March*, 1853. By Robert Clarke, *Surgeon, Colonial Medical Service.*

[Read before the Statistical Section of the British Association at Glasgow, September, 1855.]

The colony of Sierra Leone, on the west coast of Africa, was so named (Mountains of Lions) by its first discoverers the Portuguese. The estuary upon the shores of which Freetown is situate is, at its greatest breadth, about 15 miles, from which it gradually decreases to 7 or 8 miles, and, owing to its breadth, is seldom obscured with fogs, except during the rainy season, and while the Harmattan wind prevails. It is navigable 30 miles upwards, where it receives two large rivers, of which the southernmost, the Rokelle, runs 200 miles inland, but is only navigable for 60 miles of its course. The other, the Port Lokkoh, runs to the eastward about 60 miles, and is accessible to small vessels as far as the town of Port Lokkoh, at its source. The Bunce, which flows east-south-east, though denominated in the Sierra Leone Charter "a river," is, more properly speaking, a creek, running a little beyond the village of Waterloo, about 18 miles from Freetown.

The colony consists of a triangular rocky peninsula, 18 miles from north to south, and 35 miles from east to west; traversed in the longer direction by an isolated range of conical serrated mountains, rising from 2,000 to 2,500 feet above the level of the sea. The shore of the estuary is marked by a succession of amphitheatres formed by the expansion of the mountain ravines.

Sierra Leone, as a British colony, does not date further back than 1787, when its affairs were conducted by the African Company. In 1807 the Company was dissolved, and the colony transferred to the Crown. The establishment of the mixed Courts of Commission for adjudication of captured slavers, added considerably to the importance of the colony, which, as an entrepôt, becomes yearly of greater commercial value.

Freetown, the capital, in 8° 29′ N., and 13° 14′ W., stands on a gentle acclivity on the northern shore of the peninsula, backed by the lofty well-cultivated mountains just named; which, however much they may add to the beauty of the landscape, do not tend to its salubrity, as they collect and retain the pestilential vapours from the low grounds on the opposite or Bullom shore, and from the swamps and creeks situated to the north-east of the colony. The soil consists, in some places, of a brownish loam or argillaceous clay; in others it is rocky or gravelly, with a large ferruginous intermixture, strewn with boulders composed of a close-grained granite. Small lumps of magnetic iron ore are scattered about the peninsula, but no iron veins have been discovered. Some parts of the lower grounds are paved, as it were, with a red, easily-worked, cavernous stone, which,

throughout the settlement, is the material in general use for building purposes. It is apparently of volcanic origin, inasmuch as in several places low ridges may be observed, burnt and baked as if a wave of molten lava had been arrested in its progress. The staple vegetable productions are those usually found in the tropical climates—yams, sweet potatoes, cassada, maize, coco or tania, and a variety of the capsicum and leguminous family. Among its variegated shrubs and plants are the coral flower, marygold, convolvulus jalapæ, cubeba, castor oil, and jatropha curcas; and the acacia, aloe, dracæna, draco, and tallicoonah trees. The mangrove tree lines the muddy banks of the rivers and creeks; and the oysters which attach themselves to its branches are plentiful and wholesome. Among the grasses I may notice the elephant, or Guinea grass, growing to the height of 21 feet, and a fine silky grass used for stuffing mattresses.

The year is divided into the dry and rainy seasons, the latter being ushered in and terminated by tornadoes. The rainy season commences with showery weather in May, but does not fairly set in until June, and during the months of July and August it reaches its climax. It sometimes rains continually for thirty hours, but more frequently twelve hours of heavy rain are succeeded by twenty-four or thirty hours, or even a longer period, of clear and pleasant weather. In September the chief fall of rain takes place during the night, but gradually diminishes in quantity as the month advances, continuing at intervals in October, with occasional heavy showers in the early part of November, when it ceases. The mean fall of rain is 189 inches; but in the years 1852 and 1853 the amount was respectively 163 and 109 inches. The dry parching Harmattan wind, which blows generally at Sierra Leone from the east-north-east, prevails in December, January, and February. This wind is accompanied with a hazy state of the atmosphere, and the sun is obscured and often only visible for a few hours about mid-day, when it appears of a mild red, causing no unpleasant sensations in the eye. The moon, which shines so brilliantly in this climate, is also obscured, and few stars can be seen distinctly. Neither dew nor moisture can be detected. The country at this season of the year has a wintry appearance, and the aridity of the soil is so great that the earth splits and cracks open, and when walked upon conveys the ringing sound so perceptible in clear frosty weather. The grass is dry, withered up, and brittle. The thermometer ranges from 84° in the shade to 75°, and the mean temperature of the year is calculated to be 81° 7′ 3″.

The population in 1850 was 44,501, of whom only 125 were white persons. Rejecting 12,816 children, 17,621 were engaged in agriculture, and 14,064 in trade. The natives have assumed the European dress, and the houses of all but the very poorest of them are furnished comfortably; and they are, in many respects, better off than the same class in England. Nevertheless there is a good deal of poverty among them; but the wealthy native shop-keepers and traders live in a style of luxury attempted by few persons in a similar position in this country. The houses of the mass of the natives are square or circular huts, composed of stakes interwoven with wattles, plastered over with mud, and thatched with grass or bamboo. For many years past there has been a growing desire to

build good substantial houses of stone, and a great many have been completed in Freetown and the villages.

The food of the negroes consists chiefly of rice, yams, coco or tania, cassada, maize, sweet potatoes, ground nuts, with meat or fish, which they do not object to eat when semi-putrid. Their favourite dish, and one indeed in general use in West Africa, from the chieftain to the peasant, is called "Palaver Sauce," a savory and nutritive food. It is a stew prepared with palm oil, fish, or meat, or both together, flavoured with cayenne or capsicums, and salted to taste. This is eaten either with rice, yams, or cassada. Grated cassada, when boiled, is also made up into balls, and is sold under the name of "foo-foo." When boiled it forms a tenacious sticky mass, portions of which are rolled up between the fingers into round pellets, dipped into the soup or stew, and then swallowed. The natives allege that one meal of foo-foo is sufficient food for one day, and that its continued use causes "head turn," or giddiness. It is also the article used by the colonists for poultices. The general method of eating their food is to take it up with the hand in small portions; and I have often been astonished at the enormous quantity they consume, more particularly if boiled rice with palm oil stew is placed before them.

The banana, plantain, orange, sour and sweet sops, mango, lime, and pine apple, are largely eaten, and such vegetables as the shalot, pumpkin, squash, calciloo or spinach, and a great variety of tomatoes and greens, help to vary their food and render it more piquant and wholesome. Agidi, a sub-acid preparation, made from Indian corn, is continually hawked about for sale.

Although Sierra Leone can no longer be justly called "the white man's grave," it must not be supposed that the climate has in any degree changed. That the mortality has diminished is unquestionable, but for this several causes may be assigned. The style and comfort of the houses occupied by Europeans are improved,—they dress in a manner better suited to the vicissitudes of the climate, a greater degree of temperance prevails, and the general use of quinine has considerably shortened and reduced the amount of illness and mortality.

The causes of the insalubrity of the colony are patent; they are such as prevail more or less in all tropical climates on the banks or at the mouths of great rivers. Its rivers are sluggish, brackish streams, fringed with the mangrove, and interwoven with rich masses of vegetation, as pernicious to the health as they are pleasing to the eye. These trees and plants retain the vegetable ooze and animal *débris* so abundant in these streams, emitting a poisonous sickening stench. Among the causes of the unhealthiness of the climate the electric condition of the atmosphere and the sudden alternations of temperature may be mentioned; but the latent cause of the atmospheric impurity has hitherto eluded the investigations of the chemist. Sulphuretted hydrogen, no doubt, plays a distinguished part in this infection of the atmosphere.

It is a fact worthy of note, that the European, after his constitution has become assimilated thoroughly to the climate, is better able to resist the climatic influences than persons of mixed colour. The

latter class (in the colonial service at least) are, as a body, more frequently on the sick list than their European colleagues.

The black population of Sierra Leone represents almost every tribe in West Africa; and the variety of languages makes a perfect Babel of confusion. Fifty different dialects are in use among the liberated Africans. This makes the colony the theatre of a variety of disorders: many of these races differing considerably in their mode and habits of life, and progress in civilization.

Europeans, soon after their arrival, are usually attacked with a fever, variously called the acclimating, seasoning, and bilious remittent fever of the country. Individuals have occasionally been seized a few days prior to their arrival, and have been landed labouring under the disease. Others, on the contrary, have escaped for a period of more than three years, and, in rare instances, during a residence of nearly eight years. The attack usually comes on between the third and sixth month.

It was my lot to serve at Sierra Leone during four periods in which yellow or epidemic fever prevailed, namely, in 1837-38-39, and in 1847, and yet I am compelled to say that the investigations of sagacious inquirers have failed to discover the cause of its appearance at irregular intervals in its sporadic form. Medical opinions have, nevertheless, been put forward, perfectly satisfactory, at least, to the theorist, to account for an outbreak of yellow fever. For example, in 1847, one foreign mercantile house lost four European clerks successively by yellow fever, and this circumstance was eagerly grasped at by men of speculative minds, to prove that the fever which attacked these persons was caused by raw hides, which it is alleged were stowed away on the ground floor of the house in which two of them lived, and where two performed their duties during the day. This view is rather singular, considering that it is the constant custom of the merchants to stow raw hides about their dwelling houses, and in various sheds close to them, at all times and seasons of the year, yet without any such consequence accruing therefrom as an eruption of yellow fever. Again, in 1847, the invasion of the disease was attributed to the scanty and late fall of rain, but this condition was, to a certain extent, also present in 1853, as little or no rain fell until the end of July, and in August the fall of rain was chiefly during the night; nevertheless, there were only six cases of remittent fever among the resident Europeans, three of whom died. The mortality was very considerable among the crews of merchant seamen, but this is always more or less the case, as they are much exposed to malarious influences whilst loading timber, ground nuts, &c., in the creeks and rivers. With reference to the treatment of yellow fever, little more satisfactory can be stated than that no one remedy can be relied upon as having been more beneficial than another in the treatment of this disease.

The controversy respecting its contagious or non-contagious properties now seems merged in the identity of the two diseases, bilious remittent and yellow fever; and as to whether the bilious remittent ever runs into or terminates in yellow fever. My experience and observations have led me to view yellow fever as a disease *sui generis*, exhibiting distinct and specific characteristics; but at the same time

it is my opinion that, under certain circumstances, bilious remittent fever does run into and terminate in an attack of yellow fever.

After an attack of remittent fever Europeans are liable, for one or two years, to be harassed with intermittent fever. But as the constitution becomes assimilated to the climate these attacks diminish in frequency, and the intervals between them are prolonged, until they cease altogether, except when induced by any casual imprudent exposure to the weather or by mental annoyances.

With reference to intermittent fever or ague in its masked form, I can fully corroborate the statements respecting the distressing mental depression it produces, accompanied with great nervous irritability; and that occasionally it manifests itself in neuralgic attacks of a severe character, sometimes inducing numbness of the legs and feet, which symptoms soon yield to quinine and other tonic modes of treatment; occasionally, however, the paralysis becomes permanent. Both natives and Europeans are subject to splenitis,—the sequence of repeated attacks of intermittent fever. This enlargement of the spleen the natives call "fever cake." In the case of Europeans it requires change of climate for its removal.

In glancing at the diseases which afflict the great mass of the coloured inhabitants, my experience of eighteen years does not support the theory that uncivilized are less liable to disease than civilized persons. The Africans are equally liable with their European brethren to disease; but it is unquestionable that, like the other dark races of man, they are not subject to remittent fevers or to the infection of yellow fever. The exceptional cases happening amongst them in no way invalidate this opinion, but, on the contrary, in some respect confirm it. In them the first stage of fever is of short duration, whilst the second generally terminates in discharges from the skin and bowels. I have heard of negroes taking yellow fever, but I never saw it, nor have I met with any of my medical brethren on the coast who could point out a genuine case as having occurred in their practice. Amongst a variety of causes which determine the characteristic features of the diseases of the negro, may be mentioned their addiction to venereal excesses; their living in a most miasmal atmosphere; and their diet, which consists chiefly of fish and vegetables, largely seasoned with pepper.

As the liberated Africans and their immediate descendants constitute the bulk of the population, and as the colonial hospitals at Kissy afford the best means of observing disease, it will be necessary to describe this establishment.

The Kissy hospitals are situate in the village of Kissy, four miles from Freetown. The upper hospital stands upon the south side of the mountain, and received the liberated Africans from the condemned slavers, colonial poor, and British and foreign destitute seamen. The constant influx of captured negroes rendered the number of sick under treatment liable to great and sudden augmentation, several hundreds being sometimes admitted in a single day. Besides these patients there was always a number of children from the liberated African schools, and occasionally a few military pensioners from the West India regiments. This hospital was converted into a lunatic asylum in 1854, the patients having been then removed

to Freetown to the buildings formerly used for the reception of liberated slaves.

By the annexed returns it will be seen that the patients under treatment and the deaths were, in the nine years, 1845 to 1853, as follows:—

	Under Treatment.	Deaths.	Mortality per Cent.
1845.....	1,829	839	45·87
1846.....	514	110	21·40
1847.....	3,124	1,730	55·38
1848.....	2,175	735	33·79
1849.....	941	270	28·69
1850.....	795	151	18·99
1851.....	744	197	26·48
1852.....	517	117	22·63
1853.....	433	113	26·09

The Europeans treated in the Kissy hospital (destitute British and foreign seamen), were brought to hospital under great disadvantages. The former were generally deserters from their vessels; the latter were landed from vessels captured by our cruisers. Both had experienced the treatment to which such people are subject when attacked with illness, by the keepers of crimp-houses in Freetown, as elsewhere. For example, as soon as the landlord perceived that he could gain nothing more by harbouring these men he applied for an admission note to the hospital, to prevent any claim for funeral expenses; and in this way these persons came under treatment for fever or dysentery when the powers of life were all but exhausted, and the mortality among them was consequently proportionally great.

At the period I took charge of the Kissy hospitals (1837), the slave trade was in active operation, consequently great numbers of liberated Africans were constantly received into hospital. It was a most distressing sight to witness the arrival of these poor creatures; and it is necessary to make a few preliminary remarks in order clearly to understand the difficulties with which the medical officers had to contend. The appearance of the slaves when landed from the condemned ship was most striking. In some the expression of the countenance indicated suffering, moral and physical, of the most profound and agonising nature. Others of them gazed vacantly around them in the most utter helplessness. Occasionally, among the newly-arrived groups, all sense of suffering was merged in melancholic or raving madness. The wizened, shrunk, and skinny features were lighted up by the hollow feverish eye. The belly was, as it were, tacked to the back, whilst the hip bones protruded, and, in some cases, became the seat of foul sloughing ulcers. The hand and skinny fingers seemed much elongated by the great and neglected growth of the nails, and they were so deplorably emaciated that the skin appeared tensely stretched over, and tied down to the skeleton. The legs refused to perform their functions, and they reeled and tottered about from sheer debility. Their squalor and extreme wretchedness was heightened, in many cases, by the party-coloured evacuations with which their bodies were besmeared. They rushed towards the water pro-

vided for their use, fighting with each other to drink and drink again, as if their thirst was unquenchable. They would devour their food quarrelling with each other for the possession of a bone or fragment of meat, and what was left they would carefully put away in little bags, suspended from their necks, to be eaten at leisure. When large numbers of the sick were suffering from dysentery, the condition of the wards and yards in the morning was extremely loathsome. This was, in a great degree, unavoidable, as the sick were too weak to crawl from their mats to the commode, although everything was done under the surgeon's orders to endeavour to keep the wards as clean and wholesome as the crowded state of the hospital would admit of. Many of them laboured under dysentery, diarrhœa, pulmonic, and intractable cutaneous and rheumatic complaints. Others suffered from abdominal dropsy, or anasarcous swellings of the extremities, or from œdematous swellings of the face, legs, and feet, from emaciation, and from extreme debility. Many were afflicted with acute, or purulent ophthalmia, which, in several cases, rapidly terminated in destruction of vision. Ophthalmia tarsi, cataract, iritis, and amaurosis, were of frequent occurrence. Numbers suffered from abscesses in various parts of the body, or from gangrenous ulcerations. As these spread the bones were denuded, became carious and exfoliated. Ulcers, as may be perceived by the returns, formed a large proportion of the cases treated. They were often occasioned by slight injuries, as the bites or stings of insects, or scratches; and, as may be supposed, in a population the majority of whom walk barefooted, injuries of the feet and toes are frequent. When one or other of the toes becomes ulcerated, and does not heal up, they are in the habit of tying a ligature round it to deaden sensation, and it is gradually tightened until the toe is removed, or nearly so. Many cases of large chronic ulcers occur among them from neglect, caries, or necrosis, which, from improper treatment, never heal up. Indeed, few of the coloured inhabitants are free from the marks of former deep-seated ulcerations, situated chiefly upon the feet and legs. A malignant sloughing ulcer of the face is occasionally met with in children of three or four years old; it often penetrates the cheek, and extends to the lips before advice is sought, and the little sufferer frequently dies in spite of every effort to arrest the disorder. In some very young children the disease has appeared during the period of teething, inflammation of the periosteum being followed by suppuration and subsequent exfoliation of a portion of the alveolar processes. Ulcers are badly managed by the negroes, inasmuch as they are constantly washing them, thereby softening the granulations and arresting the reparative process.

As an erroneous impression may possibly be entertained that dysentery is endemic at Sierra Leone, from its forming so large a proportion of the cases in the annexed returns, it is proper to mention that the large numbers therein set down occurred among recently arrived slaves. Fortunately Sierra Leone is remarkably free from dysentery, which scourges the settlements to the southward, an immunity chiefly owing to an abundant supply of the purest water.

Dropsical effusions, as a sequence of dysentery, are, as may be observed by reference to the Hospital Returns, of frequent occur-

rence among the liberated Africans; and where the operation of tapping was resorted to the number of recoveries bore a very small proportion to the number of deaths; for example, of forty-eight cases only two recovered. Native children are liable to swellings of the legs and feet, resembling anasarca, and proving fatal unless properly treated. Where the children are puny, and do not thrive well, they are washed by the negroes with a variety of cold vegetable astringent infusions.

Prolapsus ani and hæmorrhoids are occasionally subjects of treatment, especially the former complaint. Both Europeans and Africans suffer from a dangerous cholic denominated "dry belly ache," very closely resembling "painter's cholic" in symptoms and character, and requiring very similar treatment for its removal. To relieve the tormina, or griping pains, the natives drum gently over the abdomen with the fingers of both hands and give bitter infusions.

The blacks (as will be seen from the annexed tables) are very subject to constipation, attributable probably to the nature of their food; and they are constantly taking large doses of purgative medicine.

The exanthematous disorders, variola, varicella, and rubeola, more or less constantly prevail. The first occasionally assumes a severe epidemic form, causing great alarm and mortality. The blacks oppose a passive resistance to vaccination, which the medical officers have much difficulty in overcoming. The natives treat confluent small pox by opening the pustules, lubricating the body with palm or nut oils, and keeping the patient close to the fire.

The negroes are extremely liable to diseases of the skin, as will be perceived by reference to the returns.

Elephantiasis, and lepra in all its hideous forms, scabies, or kra-kra, as it is commonly called on the coast, frambœsia or yaws, psoriasis, herpes, ichthyosis, prurigo, scrofulous ulcerations of the skin, noli-me-tangere, acne, and aphthous ulcerations of the mouth, with a spongy and bleeding state of the gums and looseness of the teeth, prevail. An affection of the angles of the mouth is also seen among them, in which the colouring matter of the skin disappears, leaving a blanched surface on both sides a quarter or half an inch in extent.

The negro suffers severely from rheumatism, rheumatic swellings of the large joints, and anomalous fugitive pains, often brought on by careless exposure to chills while perspiring; for it frequently happens that after the most violent fatigue they will lie down on the ground and fall asleep, and during the moonlight nights they are often in the habit of sitting or lying on the ground, conversing with one another, for hours together, sleeping the rest of the night in the open air, incautiously exposed to the heavy dews, protected only by a cotton cloth. They are also liable to a painful neuralgic affection of the soles of the feet, which disables and cripples them. They describe it as a burning pain, and it is very obstinate and intractable. I have occasionally met with a soft polypoid tumour situated below the tongue, or between it and the floor of the mouth, which impedes articulation, so that the patient speaks thick. Polypus of the nose is rather a frequent disease, and also relaxation of the uvula, and enlargement and ulceration of the tonsils. They are quite as liable to

toothache as the Europeans. Chronic inflammation and thickening of the membranes of the nose and mouth are of frequent occurrence among them, and also erysipelatous inflammation. Enlargement of the glands of the neck is frequent, and occasionally cases of goître present themselves. Numerous cases of lupus, or noli-me-tangere, (as will be perceived by reference to the Hospital Returns) occur, destroying every feature, and leaving the most hideous deformity.

The scrofulous diathesis, it will be seen by reference to the annexed returns, flourishes quite as much in this part of Africa as in any part of Europe, although this is denied by certain writers.

During a residence of eighteen years I never saw a case of hydrophobia, although hundreds of half-starved mangy curs patrol the streets and roads of Freetown and the villages.

Leprosy is seen in all its varied phases, from the stage of discolouration of the skin by brownish coppery patches, to ulceration and dropping off of the toes and fingers, splitting of the nails, loathsome furfuraceous deposits, and defœdations extruded from the skin; and the features, in some instances, can scarcely be distinguished, misshapen tumours growing from the face and ears.

Dracunculus, or gunea-worm, is, for the most part, seen in slaves from the windward and gold coast. The scrotum, hams, thighs, arms, hands, and feet, are the parts most frequently invaded by this parasite. The natives extract it skilfully by means of a piece of thread, which they attach to the protruded portion of the worm, and then wind it round the limb, securing it to a piece of stick; and in this way day by day they cautiously withdraw the worm. Incautious meddling with the worm, so as to break it, inflicts on the patient prolonged sufferings, inasmuch as it will wander from the position it occupied only to appear elsewhere, after exciting great constitutional disturbance. To the southward some of the natives cauterize the extruded portion of the worm, in the hope of destroying its vitality; but I believe this mode of treatment to be of no practical value.

Syphilis and all its sequelæ are very prevalent in both sexes. In few of the males are the genital organs intact. In many one or both testes will be found enlarged, or, on the contrary, much diminished in volume, whilst others have the chords thickened, and varicose; very many have the inguinal glands permanently enlarged, and old cicatrices from ulcerated bubo are frequent. The penis also often bears the marks of chancre, and its partial removal or complete destruction is a frequent consequence of the barbarous treatment and neglect of their native doctors. They are also subject to œdematous swellings of the penis and scrotum, and to hæmorrhage from the penis and urethra, requiring vigorous measures to repress it.

Sarcomatous enlargements of the scrotum, forming a tumour of such dimensions as to reach to the knees, and even below them, are not uncommon. They attribute it to the excessive use of palm wine; and, doubtless, leprotic taint, with hereditary predisposition, are also exciting causes. Both sexes are liable to very inveterate pruriginous affections. The females likewise suffer from numerous disorders of the pudendum. For example, œdema of one or both labia majora, permanent thickening of these organs, which are sometimes fissured or studded with warty excrescences, and enlargement of the nymphæ and

clitoris, which require removal. I have also met with ovarian enlargements in females who never bore children. Amenorrhea, dysmenorrhea, and leucorrhea, are complaints just as common to the negro as to the European women, but hysteria rarely occurs among them.

Gleety discharges, the sequence of repeated attacks of gonorrhœa, are very common, and strictures and fistulæ of long standing are constantly brought to the surgeon's notice. A simple urethral catarrh, wholly different from gonorrhœa in its nature, has been observed to be common among the numerous neighbouring petty chiefs, and is alleged to arise from their immoderate indulgence in venery. Hernia humoralis, and hydrocele, may be observed, the former frequently, the latter disease occasionally.

Retention and incontinence of urine are common, especially the former; but calculous diseases are almost unknown.

Impotence is a common complaint on the coast, for which medical men are frequently consulted; they call the disease in their vernacular "broke back," and importune the surgeon for aphrodisiac remedies to restore their virile powers, or, as they term it, "to strengthen their back."

Parturition in the negro has been generally represented as an easy process, and soon accomplished; but my observation is quite opposed to this opinion. For the negro woman suffers as much during child-birth as the female of civilized countries; and unfortunate cases have happened, where the woman has died undelivered. Instrumental assistance is as often required: and some of the worst cases of laceration of the perineum, recto-vesical fistula, neglected prolapsus uteri, and even laceration of the soft parts, to such an extent as to lay the vagina, rectum, and neck of the bladder into one common cloaca, were brought to hospital for medical treatment. Among the natives the practice of midwifery is confided to aged women. The patient is generally placed on a mat on the floor, close to the fire, with a woman behind to support her in a semi-recumbent posture. The external parts being freely lubricated with oil, the midwife seats herself before the patient, and, during a pain, encourages her to bear down strongly, at the same time compressing the back by pulling together with all her force the ends of a shawl previously wrapped round the loins. She also, from time to time, rubs the abdomen with her hand smeared over with "doneh grease," or shea butter; and if the delivery is slow and lingering, she causes the woman to get up and walk about, or bathes the belly with a foment of country leaves and herbs. They never think of supporting the perineum, but some of them have been known to snip it to facilitate delivery. To hasten the expulsion of the placenta she is directed to retain her breath and to blow strongly into her hand. If this does not succeed they bandage the abdomen tightly, make her stand upright, and shake her well; and sometimes they lave her abdomen with cold water while in this position, and she is allowed to drink cold water to constringe, as they believe, the womb, and to cause the placenta to separate. I have known the woman placed upon her hands and knees, the cord being fastened by a string to one of the toes, and while in this position the nose was irritated with a feather, and the fauces tickled in no very gentle way with the handle of a

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spoon or fork to excite vomiting, and thereby to bring on uterine contraction; and this barbarous custom was, as might be expected, occasionally followed by prolapsus uteri.

Abortion, I have every reason to believe, is sometimes attempted by improper means, but they rarely succeed in effecting this object.

Medical officers are frequently requested to examine the persons of very young female children alleged to have been violated. In such circumstances the greatest caution is required, inasmuch as many cases turn out to be accusations got up for the purpose of extorting money. The child should therefore be interrogated separately, when it often happens that the ruptured hymen, bloody oozings from the vagina, and other marks of apparent violence, which, at first sight, would mislead the surgeon as to the cause of the injury, have, in a great many instances, been occasioned by the fingers of some old woman confederate. The practice these women pursue is to poke the fingers rudely into the passages on the pretence of ascertaining whether the child has or has not been violated, and hence follow injuries which assume appearances resembling those of forcible connection.

With respect to the period of puberty in the negress, all my inquiries have tended to show that it commences about the age of ten or twelve years. Girls who have arrived at this age, and much beyond it, may be occasionally observed walking the streets naked, with the exception of a long narrow strip of white calico which hangs before and behind, below the knee, from a circlet or zone of beads which surrounds the loins, and which scarcely covers the genital organs. These streamers are the symbols of the girl being marriageable. During the presence of the catamenia they are deemed unclean, when a coloured strip of calico is substituted to intimate the presence of the secretion.

Circumcision is much practised in the colony among the males; but I am not aware that the young female undergoes this rite. The women of the adjacent countries, viz., the Timmanees, Soosoos, Sherbros, and Kussohs, are all circumcised in houses set apart for the performance of the operation, and called "Bundoo."

Writers treating of the diseases of the negro of the West Coast of Africa have asserted that the negro is not disposed to disease of the brain or membranes; but this is incorrect. Mania is also on the increase. The largest number of cases occur in the month of November.

I have occasionally witnessed cases of delirium tremens among the black and coloured population, but chiefly among the Europeans. It has occurred in persons of sober habits, of nervous anxious temperaments, who had experienced great vexations and annoyances.

Paralysis in all its varied forms prevails, and often accompanies leprosy. The leper is frequently palsied in one or both of his feet, losing the controlling power, so that the foot flops down suddenly as if hinged upon the leg.

Cases of tetanus, idiopathic, and following severe injuries, occasionally come under treatment. Trismus infantum, the "drop jaw" of the natives, or "the nine days sick," as they call it, is common. If the child escape its influence until after the ninth day, they then consider it safe.

The negroes are subject to apoplectic attacks, the result frequently of sun stroke, or coup de soleil.

Epilepsy, as the tables show, is common, and chorea is occasionally brought under the surgeon's notice. All classes of negroes suffer from lethargus,* or, as they call it, the "sleepy dropsy." This disease is extremely fatal, the patient afflicted with it will fall asleep even while eating; but it is a curious fact that while in general they do not sleep well during the night, exposure to the noonday sun and glare immediately produces deep lethargic sleep. Some of these poor creatures wander about the streets to the great danger of being ridden over. The natives endeavour to cure it by purgative and sudorific remedies and hot baths; but they view its attack as fatal. It generally destroys the patient within a period of three or four months.

Icterus, hepatitis, and other functional and organic diseases of the liver, are increasing among the blacks from their growing indulgence in ardent spirits.

Europeans long resident on the coast are very liable to boils. They are extremely troublesome, appearing in crops upon the scalp, back of the neck, shoulders, and extremities. These inflamed indolent tumours vary in size from a small pea to a walnut; they suppurate slowly, and contain matter of a cheesy consistence.

Dyspeptic, and an extensive range of nervous, disorders also prevail, the Europeans suffering much from the former; and gout inflicts its pangs and twinges on those whose constitutions predispose to its attacks, just as in Europe.

Verminous disorders are very common among the Europeans and among all classes of the inhabitants. Persons trading to the south of the settlement suffer most from these parasitical animals, which often occasion severe and distressing sensations, producing cholic and other symptoms, and sometimes terminating in death. The tœnia lata, tœnia solium, lumbrici, and ascarides, are frequently subjects of medical treatment.

The medicine called koussa, a preparation of the flowers of the brayera anthelmintica, a native of Abyssinia, was successfully tried in cases of tape worm, wherein turpentine and pomegranate were found utterly useless to expel them.

Great difficulty is experienced in rearing European children. In general they thrive admirably until teething begins. It is at this epoch they are frequently attacked or harassed with intermittent fever, which, by repeated recurrence, causes enlargement of the spleen and functional disturbance of the stomach and bowels; and they soon become cachectic, and unless removed to a more genial climate drop into an early grave.

Native infants who do not thrive well are often brought to the medical officers, who are referred by the mothers to the anus as the seat of the disorder. The secretions from the sebaceous follicles, and from the glandular structures concerned, are more abundant than usual, and the surrounding parts to some degree excoriated. This affection they call the "Macroo or Macra," and for its relief they

* See a contribution of mine on the Treatment and Pathology of Lethargus, in the London Medical Gazette for September, 1840, which Sir James McGregor did me the honour to communicate to that journal.

apply fomentations and give decoctions. It soon yields if due attention is given to improve the little sufferer's health by proper diet and suitable medicine.

In the course of my lengthened residence at Sierra Leone I met with one case of imperforate anus in the child of a sambo by a negress; and I was informed by a medical officer of twenty-two years' experience in the colony that he had only met with two cases, the one just referred to being the second case. It may be necessary to explain that the term "sambo" means the child of a mulatto by a black.

Many of the children have very large bellies, which the natives look upon as of no consequence, inasmuch as the enlargement gradually disappears. They do not consider it is caused by worms or other disease, but there is no doubt that, in many instances, worms do occasion it.

The negro is a most irascible creature, easily excited to anger, and prompt to take summary vengeance upon the party who may have injured or annoyed him. As might therefore be expected in a semi-barbarous community, wounds of the person are of frequent occurrence. Sometimes it is a woman who, irritated by her husband's infidelities, endeavours to incapacitate him from future amours. Cases have been brought to me where the testes have been dislodged by a bite, and where they merely hung by the chords. Others present themselves for surgical assistance with portions of the nose, ears, lips, or fingers, bitten off. Penetrating wounds of the thorax and abdomen are by no means rare; stabbing, upon the whole, being on the increase among them.

Very severe injuries, as burns, gun-shot, lacerated, and incised wounds, as will be seen by reference to the annexed tables, are occasionally subjects of treatment. Persons incautiously bathing or wading in the sea, rivers, or creeks, get bitten by sharks and alligators, whose cases require immediate amputation; and fractures and dislocations (especially of the lower jaw), the result of accident or violence, are just as numerous in proportion to the population as in any other colony.

Accidents from snake-bites are rare occurrences, although snakes are very numerous. Instances do happen where the person bitten has died within a period ranging from twenty minutes to two hours after the injury.

The coloured inhabitants, and more especially the newly-arrived liberated Africans, are frequently attacked with mal d'estomac, or dirt-eating. It is induced by nostalgia. There is a total vitiation of appetite; clayey matters, such as the red earth of which the ant-hills are composed, are eagerly sought after and devoured. In this very fatal disease the colour of the skin gradually alters from a black to a dirty whitish brown, or clay-colour. The tunica conjunctiva assumes a yellow dusky aspect, and the countenance looks dejected, the eyelids puffy, and the face bloated. The inside of the lips and tongue looks, as it were, blanched, and the gums become soft and pallid. The pulse, at first normal, becomes quicker and very small, accompanied with palpitation of the heart and throbbing of the great vessels of the neck. Respiration is always easily hurried and is often

oppressed. The abdomen swells, the mesenteric glands are enlarged and hardened, and the extremities become anasarcous. In the last stage of the disease effusions take place in the abdominal and thoracic cavities.

Hernia, congenital and acquired, especially scrotal and umbilical rupture, are often seen. Even the remarkably athletic Kroomen frequently suffer from hernia; and this might be expected, as they are much employed in dragging timber and other laborious work. Exomphalos is very common, and is attributed to neglecting to bandage the umbilicus after birth, or it arises, as some suppose, from the chord being cut too short. This unsightly protrusion is viewed by the negroes rather as an ornament than as a blemish.

All classes of Africans suffer severely during the damp rainy weather; and towards the end of November, (when the Harmattan wind sets in,) from catarrh, pneumonia, hœmoptysis, and pleuritis, and young persons about the age of ten and twelve are subject to sudden attacks of pleurisy. Children, especially during the rainy season, are often attacked with hooping cough, and croup occasionally occurs among them at this time of the year. The negro is very liable to phthisis, but I have only met with three cases of this disease among Europeans, and they appear to have brought the seeds of the disorder with them.

Deformed persons are by no means rare. All the varieties of distorted spine which give rise to the hunchback, together with a multiform variety of talipes, or club feet, may be observed. The bones of the leg and thigh are, in a good many of them, twisted. Malignant tumours are rare, but fibrous growths and those of a steatomatous and ganglionic character frequently come under surgical treatment.

I have seldom noticed disease of the arterial tunics as in aneurism, but the practitioner is often consulted for palpitation of the heart and neuralgic pains of that organ.

Stammerers, hare-lipped and tongue-tied infants are quite as numerous as in Europe; and disease of the organ of hearing is just as common, although deafness, congenital or acquired, is an infirmity, upon the whole, of less frequent occurrence. The proportion of persons blind from amaurosis and cataract is much greater. In a case of cataract of both eyes of several years' duration, the patient, a Serrawoolie, about sixty years of age, was successfully operated upon by a countryman who had come from the interior (I believe Footah,) to Sierra Leone for commercial purposes. His mode of proceeding was first to administer country medicines to act upon the skin and bowels; and before operating, the eyes were freely anointed with the warm fat of a newly-killed sheep. As I did not see him operate, I cannot speak of the instrument employed or the mode of using it, but the extraction was effected, and sight restored. For some days after the operation the patient was kept secluded in a darkened room, and attention given that his food was of a suitable quality. This speaks well for the surgical skill of the higher classes of Africans, as the Mandingo, Sarrawoolie, Foulah, and Ioloff races.

The mortality at the Kissy hospitals was very great, and this circumstance can be readily accounted for, inasmuch as a large majority

of the patients were recently captured slaves and pauper colonists. Many of these persons were brought to the hospital in the last stage of exhaustion, and died a few hours after their arrival; others even expired by the way. Moreover, a very large proportion of the emaciated and debilitated sick died within a day or two; and as the names of all these persons were recorded in the hospital books, the per centage of deaths was thereby largely increased.

There was also great difficulty presented to the medical officers in applying suitable remedies, from the almost total impossibility of their arriving at a true diagnosis of the case.

The moral and physical causes of depression were often so overwhelming and so intensely concentrated, that the combination produced disease in such formidable shapes as to be beyond remedy. The mortality was further increased by old debilitated men and women seeking admission to the hospital for shelter during the rainy season, and a great many newly-arrived liberated Africans then came in who had been employed by the villagers, from whom they had received but scanty food, and that of the coarsest kind, and whose persons were exposed in all weathers, whilst merely covered with tattered rags barely sufficient to hide their nakedness.

The liberated Africans, and indeed all classes of the coloured inhabitants of Sierra Leone, put great confidence in country remedies, and, in too many instances, have recourse to European methods of treatment only after they have tried all the native remedies with which they are acquainted. At the same time it must be admitted that the more intelligent among them eagerly seek the advice and assistance of the European surgeon, whenever an opportunity is afforded them of doing so. The class of persons in West Africa styled "country doctors" impose upon the credulity and superstitious fears of their fellow-countrymen by means of Fetishes, and amulets or grisgris. They likewise prepare a quantity of crude decoctions, powders, &c., from the roots, leaves, and bark of trees, and plants, culled from the jungles; but their knowledge of their medicinal properties is of the rudest and most imperfect nature. Moreover, as they are gathered without reference to the season of the year and other important conditions of the plants, they are uncertain in their action and often dangerous in their operation. These barbarous remedies are, besides, administered in such large doses, without reference to the age, sex, or strength of the patient, that in this way many lives are yearly sacrificed. It will be acknowledged by persons at all conversant with the African character, that this system of jugglery and quackery exerts the most injurious influence in retarding the progress of civilization among the negroes.

In headache and other head affections they resort to cupping. The scarifications are made with a sharp knife, when a small horn or calabash is applied, the air being rarified by burning a piece of cotton.

Sometimes several deep scarifications are made over the part affected, which is then fomented to promote the bleeding. Venesection from the arm is not practised; but they let blood from the veins of the hands and feet to relieve local pains. Leeches, although abundant and easily procured, are not employed by the natives.

They occasionally shave the head to obtain relief from head ache; but the universal custom is to bind it very tightly with a bandage, and compression is sometimes strongly exerted by a circlet of small pieces of bamboo strung vertically upon a fillet, which is then bound round the head tourniquet fashion. The leaves of the plantain, lime, and castor oil plants are favourite applications, from their refreshing coolness, and they are frequently pounded and applied over the temples and forehead for the same purpose.

They also daub the skin over with clay to relieve fugitive pains; and when suffering from ophthalmia they coat the eyelids and surrounding parts with chalk. They have great faith in rubefacients of every kind; "doneh grease," a vegetable fatty substance, better known as shea butter, chimpanzee fat and marrow, and the adipose tissue of the monkey and alligator are in high favour with them. In cases of ulcerations and contused wounds they apply charcoal, clay, or pounded leaves to the injured part.

In conclusion it may not be irrelevant to add a few remarks on what appear to me to be the best means of preserving health on the West Coast of Africa. In the foremost rank should be placed temperate and regular habits; the moderate use of wine, far from being injurious, is necessary to counteract the depressing and debilitating influences of the climate. It is a matter of the greatest importance to protect the skin from chills; and this is best done by wearing under-clothing of flannel, or, what is better, a mixture of cotton and wool. Out of doors the head should be well protected from the sun by a thick hat of light fabric; and to all who value their health it is essential to use an umbrella during the heat of the day. If a person is overheated, and suffers from profuse perspiration, he should at once change the whole of his clothing, and not simply take off coat or jacket, and then sit down to cool himself in a current of air. The siestas so much recommended are very good, but they certainly cannot be indulged in by the mass of Europeans resident in tropical countries; and it is undoubtedly true that on the West Coast of Africa, as elsewhere, mental and bodily activity contribute largely to good health. It is hardly necessary to recommend retiring early to bed, say nine or ten o'clock, and rising early, say six o'clock, when a cup of coffee or tea should be taken, followed by a cold or tepid bath, —the cold bath to be carefully avoided when persons are suffering from hepatic or splenic enlargement.

The bedroom should be the largest and best ventilated room in all the house, and should be provided with a fireplace, so that in the rainy season it may be kept dry and wholesome. Piazza bedrooms should be avoided.

With regard to food, it should be of the simplest and most nourishing kind, with a moderate use of fruit, avoiding pastry.

By duly observing these precautions the Englishman may live almost as safely at Sierra Leone as in his own country; and he will not find, as too many have done through their own recklessness, that the magnificent scenery which greeted his eyes as he approached the African coast was but a deceitful screen to conceal the horrors of the charnel-house. The climate has been made the scapegoat of a

thousand sins, and those who live most in opposition to its dictates have been the readiest to blame it for their sufferings. If nature wears a perpetual smile in this quarter of the world it is to those only who listen to her teachings. To them no sackcloth and ashes lie hid beneath her flowery robe; and to them Sierra Leone will no longer appear an object of terror, as the "White Man's Grave."

Two tables are appended to these notes, the first of which gives the number of sick applicants sent to Kissy hospital from the several vessels on the day of their emancipation, for the period of eleven years; and the other a return of the sick and wounded liberated Africans and colonial patients treated in the colonial hospital at Kissy from the 1st day of April, 1853, to the 31st day of March, 1854. Other detailed tables in MS. are in the possession of the Society.

Table showing the Number of Sick Africans sent to Kissy Hospital from the several Vessels on the day of their Emancipation, for the period of Eleven Years.

Date.	Name of Vessels.	Years.										
		1839	1840	1841	1842	1843	1844	1845	1846	1847	1848	1851
1839. January 10th	Violenta	14	...	...	...	...	...	...	...	...	...	...
„ „ „	Gertrudes	18	...	...	...	...	...	...	...	...	...	...
„ „ 17th	Magdalene	76	...	...	...	...	...	...	...	...	...	...
„ „ „	Antario	51	...	...	...	...	...	...	...	...	...	...
„ „ 29th	Amelia	21	...	...	...	...	...	...	...	...	...	...
„ April 14th	Larvadora	38	...	...	...	...	...	...	...	...	...	...
„ May 11th	Liberal	2	...	...	...	...	...	...	...	...	...	...
„ „ „	Passos	11	...	...	...	...	...	...	...	...	...	...
„ June 5th	Sy	79	...	...	...	...	...	...	...	...	...	...
„ July 17th	Cassolandade	13	...	...	...	...	...	...	...	...	...	...
„ „ 18th	Jacarry	41	...	...	...	...	...	...	...	...	...	...
„ August 7th	Sedeon Sarde	5	...	...	...	...	...	...	...	...	...	...
„ „ 12th	Pomba de Africa	48	...	...	...	...	...	...	...	...	...	...
„ „ 15th	Constitucao	42	...	...	...	...	...	...	...	...	...	...
„ November 2nd	Site de Abril	43	...	...	...	...	...	...	...	...	...	...
„ „ 30th	Destimeda	3	...	...	...	...	...	...	...	...	...	...
„ December 17th	Vincedora	10	...	...	...	...	...	...	...	...	...	...
„ „ 23rd	Anderina	2	...	...	...	...	...	...	...	...	...	...
1840. May 29th	Olympia	...	43	...	...	...	...	...	...	...	...	...
„ December 2nd	H. M. S. Wanderer	...	119	...	...	...	...	...	...	...	...	...
„ „ 23rd	Reglano	...	55	...	...	...	...	...	...	...	...	...
1841. February 16th	H. M. S. Termagant	...	...	2	...	...	...	...	...	...	...	...
„ March 25th	H. M. S. Saracen	...	...	3	...	...	...	...	...	...	...	...
„ May 20th	Josephina	...	...	3	...	...	...	...	...	...	...	...
„ December 18th	Formigo	...	...	2	...	...	...	...	...	...	...	...
1842. March 14th	H. M. S. Pluto	...	...	...	10	...	...	...	...	...	...	...
„ April 27th	H. M. S. Ferrett	...	...	...	4	...	...	...	...	...	...	...
„ May 1st	H. M. S. Prompt	...	...	...	5	...	...	...	...	...	...	...
„ November 9th	Quida Inporta	...	...	...	31	...	...	...	...	...	...	...
1843. September 18th	Furio	...	...	...	...	25	...	...	...	...	...	...
„ December 1st	Temerario	...	...	...	...	60	...	...	...	...	...	...
	Carried forward...	517	217	10	50	85	...	...	...	...	...	...

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Table showing the Number of Sick Africans sent to Kissy Hospital from the several Vessels on the day of their Emancipation, for the period of Eleven Years.—Continued.

Date.	Name of Vessels.	Years.										
		1839	1840	1841	1842	1843	1844	1845	1846	1847	1848	1851
	Brought forward	517	217	10	50	85	...	...	...	...	...	...
1844. January 6th	Helena	...	...	...	...	...	176	...	...	...	...	...
„ March 29th	Nova Christina	...	...	...	...	...	9	...	...	...	...	...
„ April 27th	Santa Anna	...	...	...	...	...	25	...	...	...	...	...
„ June 29th	Cyrus	...	...	...	...	...	21	...	...	...	...	...
„ August 2nd	Veterado	...	...	...	...	...	48	...	...	...	...	...
„ November 13th	Aventura	...	...	...	...	...	61	...	...	...	...	...
„ „ 24th	Delegea	...	...	...	...	...	13	...	...	...	...	...
„ „ 27th	Enganados	...	...	...	...	...	50	...	...	...	...	...
1845. March 22nd	Sua Majestad	...	...	...	...	...	...	122	...	...	...	...
„ „ 19th	Hurican	...	...	...	...	...	...	8	...	...	...	...
„ April 14th	Papita	...	...	...	...	...	...	24	...	...	...	...
„ „ 21st	Echo	...	...	...	...	...	...	74	...	...	...	...
„ May 3rd	Albanez	...	...	...	...	...	...	181	...	...	...	...
„ „ 28th	Unknown	...	...	...	...	...	...	113	...	...	...	...
„ September 8th	Africano	...	...	...	...	...	...	89	...	...	...	...
„ December 5th	Isabelle	...	...	...	...	...	...	36	...	...	...	...
1846. September 30th	Seized by Mr. Palmer	...	...	...	...	...	...	...	2	...	...	...
„ November 16th	Paquita de Rio	...	...	...	...	...	...	...	42	...	...	...
1847. May 19th	Reyd. Acquitan	...	...	...	...	...	...	...	...	76	...	...
„ „ 25th	Unknown	...	...	...	...	...	...	...	...	37	...	...
„ June 11th	Unknown Cutter	...	...	...	...	...	...	...	...	13	...	...
„ July 13th	Beaulalo	...	...	...	...	...	...	...	...	44	...	...
„ August 21st	Emprendedora	...	...	...	...	...	...	...	...	35	...	...
„ „ „	18th October	...	...	...	...	...	...	...	...	1	...	...
„ „ 26th	Graen	...	...	...	...	...	...	...	...	77	...	...
„ „ 30th	Lebro	...	...	...	...	...	...	...	...	15	...	...
„ „ „	Esperanca	...	...	...	...	...	...	...	...	15	...	...
„ October 14th	Facierinha	...	...	...	...	...	...	...	...	25	...	...
„ „ „	Unknown	...	...	...	...	...	...	...	...	73	...	...
„ November 4th	Maria	...	...	...	...	...	...	...	...	40	...	...
1848. January 10th	Captured by Mr. Palmer, of Kent	...	...	...	...	...	...	...	...	...	7	...
„ „ „	Agua	...	..	...	...	...	...	...	...	...	6	...
„ „ 12th	Malaga	...	...	...	...	...	...	...	...	...	36	...
„ April 28th	Dos Amigos	...	...	...	...	...	...	...	...	...	30	...
„ May 12th	Guhyba	...	...	...	...	...	...	...	...	...	10	...
„ „ 27th	Secundi Anderina	...	...	...	...	...	...	...	...	...	15	...
„ June 19th	Bella Miquilina	...	...	...	...	...	...	...	...	...	6	...
„ July 13th	Pensarmento	...	...	...	...	...	...	...	...	...	26	...
„ August 4th	Curiosa	...	...	...	...	...	...	...	...	...	17	...
„ September 20th	Canoe Libinty	...	...	...	...	...	...	...	...	...	2	...
1851. April 10th	Brig, unknown	...	...	...	...	...	...	...	...	...	...	106
„ August 16th	Pepito	...	...	...	...	...	...	...	...	...	...	12
„ November 13th	H. M. S. Spy	...	...	...	...	...	...	...	...	...	...	2
		517	217	10	50	85	403	647	44	451	155	120

Yearly Return of Sick and Wounded Liberated Africans and Colonial Patients treated in the Colonial Hospital at Kissy, from 1st April, 1853, to 31st March, 1854.

Disease.	Remained on 31st March, 1853.	Admitted.	Total.	Recovered.	Died.	Absconded.	Remaining on 31st March, 1854.	Remarks.
Zymotic Disease.								
Syphilis	2	10	12	10	2	....	....	
Diarrhœa	1	6	7	3	3	....	1	
Dysentery	....	3	3	1	2	....	....	
Intermittent Fever	....	5	5	5	....	....	....	
Remittent Fever	....	3	3	2	....	....	1	
Rubeola	....	5	5	4	1	....	....	
Of uncertain and variable seats.								
Dropsy	1	3	4	2	2	....	....	
Scrofula	5	6	11	11	....	....	....	
Debility	3	24	27	11	15	....	1	
Gangrena	1	....	1	....	1	....	....	
Abscess	....	2	2	2	....	....	....	
Inflammation (of Scrotum)	....	1	1	1	....	....	....	
Œdema (of Legs)	....	1	1	....	1	....	....	
Anasarca	....	4	4	2	1	....	1	
Of the Nervous System.								
Epilepsia	4	4	8	7	1	....	....	
Mania	47	48	95	30	31	....	34	
Lethargus	....	7	7	2	3	....	2	
Paralysis	5	4	9	5	2	....	2	
Idiocy	1	....	1	....	1	....	....	
Cephalalgia	....	1	1	....	1	....	....	
Chorea	....	2	2	1	1	....	....	
Hydrophobia*	....	1	1	1	....	....	....	*With respect to the case noted as hydrophobia, I entertain the *decided* impression that there was some mistake on the part of the surgeon. And this amounts to a positive conviction, considering that the gentleman then in charge of the hospital had only resided two years in the colony; and, without the slightest disparagement to him, it may be safely stated that the solitary
Of the Respiratory Organs.								
Phthisis	1	8	9	4	4	....	1	
Cynanche Tonsillaris	....	1	1	1	....	....	....	
Pneumonia	....	1	1	....	1	....	....	
Bronchitis	....	5	5	1	1	....	3	
Pleuritis	....	5	5	4	1	....	....	
Catarrh	....	4	4	4	....	....	....	
Of the Digestive Organs.								
Constipatio	....	6	6	5	....	....	1	
Hepatitis	1	....	1	1	....	....	....	
Dyspepsia	2	3	5	4	1	....	....	
Verminatio	1	....	1	1	....	....	....	
Carried frwd.	75	173	248	125	76	....	47	

Yearly Return of Sick and Wounded Liberated Africans and Colonial Patients treated in the Colonial Hospital at Kissy, from 1st April, 1853, to 31st March, 1854,—Continued.

Disease.	Remained on 31st March, 1853.	Admitted.	Total.	Recovered.	Died.	Absconded.	Remaining on 31st March, 1854.	Remarks.
Brought frwd.	75	173	248	125	76	....	47	
Of the Digestive Organs.								
Parotitis	1	1	2	2	....	....	....	instance of Hydrophobia having occurred at Sierra Leone must be viewed with distrust, and altogether requires further confirmation. For my own experience, with regard to its non-occurrence at Sierra Leone, is supported by the opinion of the late talented Staff Surgeon Fergusson, and also by the concurrent testimony of the late Colonial Surgeon, Mr. Aitken, the former of whom lived in the colony upwards of thirty years, the latter, twenty-two years.—R. C.
Hernia	1	....	1	....	1	....	....	
Peritonitis	....	1	1	....	1	....	....	
Tympanites	....	1	1	....	1	....	....	
Splenitis	1	1	2	1	1	....	....	
Of the Organs of Generation.								
Gonorrhœa	1	8	9	8	1	....	....	
Amenorrhœa	....	2	2	2	....	....	....	
Sarcocele	....	1	1	....	1	....	....	
Leucorrhœa	....	1	1	1	....	....	....	
Bubo	....	1	1	1	....	....	....	
Of the Organs of Locomotion.								
Rheumatism	1	28	29	20	6	....	3	
Caries	1	....	1	1	....	....	....	
Synovitis	....	1	1	1	....	....	....	
Lumbago	....	3	3	3	....	....	....	
Anchylosis	....	1	1	....	1	....	....	
Of the Senses.								
Ophthalmia	2	1	3	3	....	....	....	
Opacity of Cornea	....	1	1	....	1	....	....	
Caligo	....	1	1	1	....	....	....	
Of the Integumentary System.								
Lupus	3	3	6	6	....	....	....	
Lepra	5	8	13	10	2	....	1	
Scabies	2	5	7	3	4	....	....	
Ulcer	17	67	84	56	14	....	14	
Frambæsia	1	4	5	5	....	....	....	
Elephantiasis	....	1	1	1	....	....	....	
External Causes.								
Starvation	....	1	1	....	1	....	....	
Injuries.								
Wound	....	6	6	3	2	....	1	
Dislocation (of Ankle)	....	1	1	1	....	....	....	
Total	111	322	433	254	113	....	66	

Lunatics.

The number of lunatics admitted to the colonial hospital, Sierra Leone, in a period of thirteen years, is shown in the annexed tables, as well as the months in which the greatest numbers were admitted; and the proportion of recoveries and deaths is shown for a period of eleven years.

The lunatics seldom lived long, being frequently cut off with dysentery or dropsy, or they become epileptic or paralytic,—complications almost hopeless. The majority, if they did not soon recover, died within two or three years of their admission to the asylum. A few survived for many years, and in one rare instance recovery took place after the lapse of twelve years. The larger proportion of the patients treated were males. The disease manifested all its varied forms. Some gesticulated and danced about the yard, uttering the foulest abuse. Religion was the unceasing theme on which others expatiated for hours together, occasionally arrogating to themselves the attributes of our Saviour. These delusions, in some instances, might be traced to the effect produced on weak minds by the exciting and barbarous exhibitions so often witnessed in their numerous conventicles of "finding the Lord," "finding peace," &c. The love of finery was shown by several of both sexes picking up rags, which they fastened to their persons, or feathers, &c., which they stuck in their hair, or passed through holes in the alae nasi and cartilage of the nose. The raving madman, the melancholic, the imbecile suffering from dementia, the idiot, the religious, suicidal, epileptic were, until 1850, enclosed together, without distinction, in the most miserable cells, and no separation could be effected. On the transfer of the colonial hospital from Kissy to Freetown in 1854, (a most desirable and much needed change,) the lunatics were removed to that building which, although in many important points ill adapted for the purpose is, nevertheless, a very great improvement on former asylums, as arrangements may be made to separate and classify the patients.

Medical Return of the Number of Lunatics Admitted *to the Colonial Hospital, Sierra Leone, in a period of Thirteen Years, showing the Months in which the greatest numbers were Admitted.*

Years.....	1841	1842	1843	1844	1845	1846	1847	1848	1849	1850	1851	1852	1853	1854	Monthly Total.
Months.															
January	...	3	2	2	2	...	3	2	2	6	6	8	5	3	44
February	...	1	9	4	3	1	4	2	3	3	5	4	4	3	46
March	...	3	5	4	2	2	2	1	1	1	11	6	5	2	45
April	3	4	3	4	2	2	1	1	3	5	4	6	3	...	41
May	2	5	2	4	2	2	1	4	2	2	5	3	8	...	42
June	1	4	4	4	4	5	3	7	...	2	7	4	2	...	47
July	2	4	1	4	2	1	2	7	...	4	6	5	1	...	39
August	2	4	1	...	1	1	3	2	3	2	3	5	11	...	38
Septembr.	3	3	2	2	5	3	...	3	2	2	7	4	5	...	41
October	2	2	...	1	2	1	4	1	4	3	3	8	4	...	35
November	...	2	3	2	4	8	1	4	3	9	7	5	4	...	52
December	1	2	2	2	1	2	1	5	5	1	3	7	2	...	34
Annual Total	16	37	34	33	30	28	25	39	28	40	67	65	54	8	...

Medical Return, showing the Number of Lunatics Treated *in the Colonial Hospital, Sierra Leone, with the Recoveries and Deaths from* 1*st April,* 1842, *to* 31*st March,* 1853, *being a period of Eleven Years.*

Period.	Total Treated.	Recovered.	Died.
From 1st April, 1842, to 31st March, 1843....	58	19	13
,, 1843 ,, 1844....	54	19	11
,, 1844 ,, 1845....	54	11	17
,, 1845 ,, 1846....	52	11	19
,, 1846 ,, 1847....	56	19	15
,, 1847 ,, 1848....	43	9	13
,, 1848 ,, 1849....	61	20	19
,, 1849 ,, 1850....	54	7	11
,, 1850 ,, 1851....	88	26	14
,, 1851 ,, 1852....	111	48	26
,, 1852 ,, 1853....	98	28	23
Total.....	729	217	181

MISCELLANEA.

PROCEEDINGS OF THE STATISTICAL SOCIETY.

Eighth Ordinary Meeting.—Session 1854-55.

Monday, 18*th June,* 1855.

Present

The Right Hon. The Earl of Harrowby, President, in the Chair.

His Royal Highness Prince Albert, K.G., &c., &c., &c

The following Gentlemen were elected Fellows of the Society:—

The Rt. Hon. M. T. Baines, M.P.
George Becke, Esq.
Christian Child, Esq.
Layton Cooke, Esq.
R. H. Coote, Esq.
J. E. B. Curtis, Esq.
Frederick Gosnell, Esq.
W. D. Lewis, Esq.
George Tomline, Esq., M.P.
W. A. Wilkinson, Esq., M.P.

The following Papers were read:—

"On the Mortality arising from Naval Operations." By W. B. Hodge, Esq.

"An Analysis of the Statistics of the Clearing House, during the year 1839." By Charles Babbage, Esq.

THE MARRIAGES, BIRTHS, AND DEATHS,

REGISTERED IN THE DIVISIONS, COUNTIES, AND DISTRICTS OF ENGLAND.

The Marriages for the Quarter ended September, 1855, *and the Births and Deaths for the Quarter ended December*, 1855,

AS PUBLISHED BY AUTHORITY OF THE REGISTRAR-GENERAL.

This return comprises the births and deaths registered by 2,196 registrars in all the districts of England during the Autumn quarter that ended on December 31st, 1855; and the marriages in 12,155 churches or chapels, about 3,685 registered places of worship unconnected with the Established Church, and 628 superintendent registrars' offices, in the quarter that ended on September 30th, 1855.

The return is, on the whole, satisfactory. But the marriages were below the average from various causes. The births were near the usual number; and the mortality was much below the average, both in the towns and in the country.

MARRIAGES.—37,151 marriages were celebrated in the quarter that ended on September 30th, or less by 999 than the numbers in the corresponding quarter of 1854. 74,302 persons were married. The annual rate for the quarter was 783 marriages to 100,000 of the population, the average of the ten preceding and corresponding quarters having been 809. Marriage was somewhat less frequent than it was in the corresponding quarter of 1854, in every county except Surrey, Kent, Hampshire, Oxfordshire, Huntingdonshire, Essex, Wiltshire, Herefordshire, Rutland, York (East and North Riding), Durham, and Northumberland.

BIRTHS.—148,853 births were registered in the last quarter of the year 1855; or more in number by 2,394 than the births in the corresponding quarter of 1854. The annual rate of births in the quarter was 3·128 per cent. on the population; which is

Marriages, Births, and Deaths, returned in the Years 1843-55 *and in the Quarters of those Years.*

YEARS.....	1843	1844	1845	1846	1847	1848	1849	1850	1851	1852	1853	1854	1855
Marriages	123818	132249	143743	145664	135845	138230	141883	152744	154206	158782	164520	159349	...
Births	527325	540763	543521	572625	539965	563059	578159	593422	615865	624012	612391	634506	635123
Deaths	346445	356933	349366	390315	423304	399833	440839	368995	395396	407135	421809	438239	426242
	MARRIAGES.												
Quarters ended the last day of													
March	25285	26387	29551	31417	27480	28398	28429	30567	32724	32977	35149	33144	29131
June	31113	34268	35300	37111	35197	34721	35844	39204	38635	40092	40446	40389	38454
September	28847	31675	35003	35070	32439	32995	33874	37636	37316	38400	39899	38150	37151
December	38573	39919	43889	42066	40729	42116	43736	45337	45531	47313	49026	47666	...
	BIRTHS.												
March	136837	143578	143080	145108	146453	139736	153772	144551	157286	161803	161729	160892	166186
June	131279	136941	136853	149450	139072	149760	153693	155865	159073	159031	158697	172420	165250
September	128161	130078	132369	138718	127173	140359	135223	146911	150594	151222	147602	154735	154834
December	131048	130166	131219	139349	127267	133204	135471	146095	148912	151956	144363	146459	148853
	DEATHS.												
March	94926	101024	104664	89484	119672	120032	105870	98430	105359	106358	118119	111970	134605
June	87234	85337	89149	90230	106718	99727	102153	92871	99458	100625	107647	102666	106584
September	76792	79708	74872	101664	93435	87638	135227	85849	91499	100382	92201	113939	87934
December	87493	90864	80681	108937	103479	92436	97589	91845	99080	99770	103130	109664	97119

near, but somewhat below, the average (3·142). There was an increase of births in every division, except in the two divisions south of the Thames and in the Eastern Counties. The registrars account in various ways for the decrease of births. At Royston the registrar says :—"Many young married men are gone into the militia." The militia is referred to also by the registrar of Hatfield; and at St. Albans "the removal of many young women with the numerous recruits," accounts for the decrease of births. Upon the other hand, "the formation of the camp at Aldershot," it is said, "accounts for the increase of births and deaths" in the district of Farnham. The registrar of Southampton notices that only 84 births took place in May, while the numbers in that month in previous years had varied from 95 to 142; and on the whole he has a decrease in the year of 136 births; which he attributes "to the fact that so many ships belonging to this port have been detained in the Black Sea, rather than to a diminution of the population." The decrease of births in Camborne, Redruth, is explained by "the fact that a very large proportion of the male population has been, for some time past, employed in America at the copper mines of the Lake District, and the gold diggings of California and Australia, where a great number of Cornish miners have emigrated, leaving their wives and families at home, who are maintained by remittances from the husbands."

Increase of Population.—In the Northern and Midland Counties the effects of temporary or local causes of the decrease of births in the South have been

England:—Annual Rate per cent. of Marriage, Birth, and Death, during the Years* 1845-55, *and the Quarters of those Years.*

Estimated Population of England in thousands in the middle of each Year.....	16721	16925	17132	17340	17552	17766	17983	18206	18403	18618	...	18786
Years	1845	1846	1847	1848	1849	1850	1851	1852	1853	1854	Mean, 1845–54	1855
Marriages.....	·860	·861	·793	·797	·808	·860	·858	·872	·894	·856	·846	...
Births	3·251	3·383	3·152	3·247	3·294	3·340	3·425	3·428	3·328	3·408	3·326	3·381
Deaths	2·089	2·306	2·471	2·306	2·512	2·077	2·199	2·236	2·288	2·354	2·284	2·269
	Marriages.											
Quarters ended the last day of												
March	·721	·757	·655	·661	·661	·702	·742	·730	·778	·726	·713	·631
June	·849	·882	·826	·805	·822	·888	·864	·885	·883	·872	·858	·822
September	·830	·822	·751	·755	·766	·840	·822	·836	·859	·812	·809	·783
December.....	1·038	·983	·940	·961	·986	1·010	1·000	1·027	1·053	1·013	1·001	...
	Births.											
March	3·491	3·498	3·488	3·252	3·575	3·321	3·567	3·582	3·578	3·523	3·488	3·602
June	3·291	3·551	3·265	3·474	3·523	3·530	3·557	3·509	3·464	3·722	3·489	3·534
September	3·140	3·251	2·945	3·211	3·056	3·281	3·317	3·291	3·177	3·294	3·196	3·265
December.....	3·103	3·256	2·938	3·038	3·053	3·253	3·270	3·298	3·100	3·111	3·142	3·128
	Deaths.											
March	2·554	2·157	2·850	2·794	2·462	2·261	2·388	2·354	2·613	2·452	2·489	2·918
June	2·144	2·144	2·506	2·313	2·341	2·107	2·224	2·221	2·355	2·216	2·257	2·279
September	1·776	2·382	2·163	2·005	3·057	1·917	2·015	2·185	1·985	2·425	2·191	1·854
December.....	1·908	2·545	2·389	2·108	2·199	2·045	2·176	2·165	2·214	2·330	2·208	2·041

* The table may be read thus, without reference to the decimal points:—In the year 1848, to 100,000 of the population of England there were 797 marriages, 3,247 births, and 2,306 deaths registered. The annual rates of marriage in each of the four quarters were ·661, ·805, ·755, and ·961 per cent.; the rates of death 2·794, 2·313, 2·005, and 2·108 per cent. In reading the population on the first line add three ciphers (000). The three months January, February, March, contain 90, in leap year 91 days; the three months April, May, June, 91 days; each of the two last quarters of the year 92 days. For this inequality a correction has been made in the calculation.

neutralized; and generally in England there is little ground of complaint or of any apprehension of a paucity of births, as 635,123 children were born in the year of war 1855; or 208,881 in excess of the number of deaths (426,242). In the last quarter of the year the excess of births over deaths, or the natural increase, was 51,734. Of the immigration into England and Wales from Ireland and Scotland during the period no records exist.

24,207 emigrants sailed from the ports of the United Kingdom at which there are Government Emigration officers; 16,111 to the United States, and 7,329 to the Australian colonies. 7,615 were ascertained to be of English origin, 840 Scotch,

The Average Prices of Consols, of Wheat, Meat, and Potatoes, also the Average Quantity of Wheat sold and imported Weekly, in each of the nine Quarters ended December 31st, 1855.

Quarters ended	Average Price of Consols (for Money.)	Average Price of Wheat per Quarter in England and Wales.	Wheat sold in the 290 Cities and Towns in England and Wales making Returns.	Wheat and Wheat Flour entered for Home Consumption at Chief Ports of Great Britain.	Average Prices of Meat per lb. at Leadenhall and Newgate Markets (by the Carcase).		Average Prices of Potatoes (York Regents) per Ton at Waterside Market, Southwark.
			Average Number of Quarters weekly.		Beef.	Mutton.	
1853	£						
Dec. 31.	93⅝	69*s.* 10*d.*	79,002	91,627	4*d.*—6*d.* Mean 5*d.*	4¼*d.*—7*d.* Mean 5⅜*d.*	135*s.*—165*s.* Mean 150*s.*
1854							
Mar. 31.	91	79*s.* 6*d.*	60,022	103,519	4¼*d.*—6¼*d.* Mean 5¼*d.*	4½*d.*—7*d.* Mean 5¾*d.*	120*s.*—160*s.* Mean 140*s.*
June 30.	88⅝	78*s.* 4*d.*	55,842	103,331	4½*d.*—6¼*d.* Mean 5⅜*d.*	4¾*d.*—6¾*d.* Mean 5¾*d.*	137*s.*—172*s.* Mean 155*s.*
Sept. 30.	93⅞	63*s.* 10*d.*	56,389	48,135	4¾*d.*—6¾*d.* Mean 5¾*d.*	5*d.*—7*d.* Mean 6*d.*	75*s.*—85*s.* Mean 80*s.*
Dec. 31.	93⅝	68*s.* 0*d.*	128,783	19,513	4½*d.*—6¾*d.* Mean 5⅝*d.*	5*d.*—7*d.* Mean 6*d.*	95*s.*—105*s.* Mean 100*s.*
1855							
Mar. 31.	91⅞	69*s.* 11*d.*	88,000	33,821	4¾*d.*—6½*d.* Mean 5⅝*d.*	4¾*d.*—6½*d.* Mean 5⅝*d.*	105*s.*—120*s.* Mean 112*s.* 6*d.*
June 30.	90⅝	73*s.* 4*d.*	94,791	57,068	4½*d.*—6½*d.* Mean 5½*d.*	4¾*d.*—6¾*d.* Mean 5¾*d.*	110*s.*—130*s.* Mean 120*s.*
Sept. 30.	90⅝	76*s.* 1*d.*	94,545	51,511	5*d.*—6¾*d.* Mean 5⅞*d.*	5*d.*—7*d.* Mean 6*d.*	69*s.*—79*s.* Mean 74*s.*
Dec. 31.	88¼	79*s.* 4*d.*	126,893	42,358	4¾*d.*—6¾*d.* Mean 5¾*d.*	4¾*d.*—6¾*d.* Mean 5¾*d.*	90*s.*—100*s.* Mean 95*s.*
Col.	1	2	3	4	5	6	7

Note.—The total number of quarters of wheat sold in England and Wales for the 14 weeks ended December 31st, 1853, 1,106,027; for the 13 weeks ended March 31st, 1854, 780,282; for the 13 weeks ended June 30th, 1854, 725,946; for the 13 weeks ended September 30th, 1854, 733,059; for the 13 weeks ended December 31st, 1854, 1,674,173; for the 13 weeks ended March 31st, 1855, 1,143,999; for the 13 weeks ended June 30th, 1855, 1,232,284; for the 13 weeks ended September 30th, 1855, 1,229,082; and for the 13 weeks ended December 31st, 1855, 1,649,610. The total number of quarters entered for Home Consumption was, respectively, 1,191,149; 1,345,743; 1,343,305; 625,755; 253,669; 439,676; 741,890; 669,636; and 550,652.

10,689 Irish, and 1,426 foreigners; the origin of 3,637 was undistinguished. The number of English emigrants during the year was 57,132.* The total number of emigrants from the United Kingdom was 166,253, exclusive of 10,554 ascertained to be foreigners. The numbers of the two sexes were nearly as 10 females to 11 males. Of 54,902 men whose occupations were distinguished, 7,167 were farmers; 29,963 were labourers: 2,541 were carpenters or joiners; 1,814 were bricklayers, slaters, &c.; 661 were painters, plumbers, or glaziers; 1,735 were miners; 639 smiths; 623 shoemakers; 816 tailors. Only 972 called themselves gentlemen, professional men, merchants, &c. Of 58,950 women, 19,386 were returned as married, 13,616 as servants; the occupations of 25,222 women were undistinguished.

The Prices of Provisions, and the Weather.—The prices of food, the state of trade, and the weather have a certain influence on the marriages, births, and deaths. Upon comparing in the table the prices of the principal articles of food in the last quarters of the year 1853, 1854, 1855, it is seen that wheat was 69*s.* 10*d.*, 68*s.*, and 79*s.* 4*d.* a quarter; beef was 5*d.*, 5⅝*d.*, and 5⅞*d.* a pound; mutton 5⅜*d.*, 6*d.*, and 5⅞*d.* a pound. Bread was dear during the last quarter. The average prices of beef and mutton by the carcase were equal, differing little from the prices of 1854, but higher than the prices of 1853. Potatoes have fallen from 150*s.* a ton in 1853, to 95*s.*, and this materially alleviates the pressure from the high prices of other articles. The weather is fully described by Mr. Glaisher, (p. 89). The mean temperature of October was above, of November and December below, the averages of those months. The air was humid in October and November, dry in December. The average quantity of rain fell at Greenwich. The mean temperature varied from 46°·5 in Cornwall and Devon to 41°·7 in North Shields; the fall of rain, from 10·5 in. in Newport and Ryde to 5·5 in. in Liverpool.

State of the Public Health.—426,242 deaths were registered in the year 1855, or less in number by nearly twelve thousand than the deaths in the previous year. The rate of mortality was 2·269 per cent., or nearly 22⅔ on every 1,000 inhabitants. The mean of the previous ten years was 2·284, so that the mortality of the year was in the aggregate below the average. The Civil Registers contain no record of the deaths in the Crimea or elsewhere abroad.

The deaths of 97,119 were registered in the last quarter of the year; and the annual rate of mortality was 2·041 per cent. on the population, or 0·167 less than the average rate of the season (2·208).

The mortality of 117 districts, comprising the chief towns of England and Wales, was, in the quarter, at the rate of nearly 24 in 1,000; the mortality in the other 511 districts containing the small towns and the country parishes was at the rate of 18 in 1,000; the average rates of the ten autumn quarters preceding were nearly 26 in 1,000 in the large town districts, and 20 in the small town and the country districts.

The mortality was slightly below the average in each of the South-Eastern Counties; Croydon and Dartford, which formerly suffered from epidemics, were healthy. Canterbury, Gravesend, and Farnham have suffered to some extent from epidemics. Small pox prevailed among the soldiers at Canterbury who, it appears, had not been vaccinated. Scarlatina prevailed in Alverstoke, Newport (Isle of Wight), Winchester and Windsor. At Winchester there have been "seven deaths from fever;" and, adds the registrar, "about the same number of deaths from syphilitic gangrene, or *ulcus grave*, which prevailed in the military hospital, and also in the county hospital and union workhouse, especially among women."

The mortality is much lower than it was last year in the South Midland Counties. In a few districts epidemics prevailed. Small pox has been fatal in Ware, in the "densely populated courts and alleys," where vaccination was neglected. The

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* From a Return with which the Registrar-General has been favoured by the Emigration Commissioners.

registrar of Royston notes :—"Sanatory arrangements much neglected, typhus very prevalent." Scarlatina was fatal in Welwyn, Harpenden (Hertford), Chesham (Bucks), Turvey, Bedford, and Cardington, Ivinghoe (Beds), in Cambridge, Ely, and Wisbeach. Small pox occasioned some deaths in these counties. Many complaints are made of the working of the Vaccination Act. Scarlatina and fever were prevalent in Cambridge both during summer and autumn.

The mortality was low in the districts of the Eastern Counties, with the exception of Risbridge, King's Lynn, Saffron Waldon, and a few more. Scarlatina in a malignant form was prevalent in the parish of Downham and in the Ingatestone subdistrict. Erysipelas, chiefly of the face, was very prevalent in Coggeshall. The registrar of Manningtree says :—"Several fatal cases of typhus and scarlatina have occurred in the parish of Ramsey, which is situate a few miles from Harwich. I consider Ramsey to be the most unhealthy parish in this district. There is a large tract of marsh land surrounding the village, and, as far as I can learn, a great want of drainage exists. Some sanatory measures ought to be at once put in motion, otherwise the inhabitants must continue to suffer from a disease which is so prevalent in almost every cottager's residence in the parish." At Sudbury only 54 deaths occurred in six months out of about 8,000 people. The population are fully employed. The improvement in the health of Rattlesden (Stow district) is ascribed to "sanatory regulations."

In the South-Western Counties the deaths (8,383) were below the average. Scarlatina was, however, fatal in several districts; so was fever. In St. Keverne, in

Deaths in the Autumn Quarters.

	1845	1846	1847	1848	1849	1850	1851	1852	1853	1854	Total 1845–54	1855
In 117 Districts, comprising the chief towns...	39293	53055	57925	46124	47685	45245	49282	49507	54491	56240	498847	48714
In 511 Districts, comprising chiefly small towns and country parishes	41388	55882	45554	46312	49904	46600	49798	50263	48639	53424	487764	48405
Total.....	80681	108937	103479	92436	97589	91845	99080	99770	103130	109664	986611	97119

Population, Deaths, and Mortality per cent. in the Autumn Quarters, 1845-55.

	Population Enumerated.		Deaths in 10 Autumn Quarters, 1845–54.	Average Annual Rate of Mortality per Cent. of 10 Autumn Quarters, 1845–54.	Average Annual Rate of Mortality per Cent. in the Autumn Quarter 1855.
	June 6–7th, 1841.	March 31st, 1851.			
In 117 Districts, comprising the chief towns	6,612,958	7,886,473	498,847	2·564	2·380
In 511 Districts, comprising chiefly small towns and country parishes	9,301,190	10,041,136	487,764	1·954	1·811
All England	15,914,148	17,927,609	986,611	2·208	2·041

Cornwall, the excess of deaths (121 to 29 births) was the consequence of the wreck of the barque "John" on the Manacles, when the bodies of 93 emigrants were cast on shore. The diminished mortality of Edington (Westbury) is referred to the works of the sanatory inspector. The poor of Heavitree, near Exeter, suffer much from the high price of food, but soup kitchens afford some relief.

The West Midland Counties (Gloucester, Hereford, Salop, Stafford, Worcester, and Warwick) experienced a rate of mortality much below their average. The deaths were 12,594 in 1853, 13,611 in 1854, and 11,172 in 1855. The decrease is most striking in the great towns; thus, in the last quarters of 1853 and 1855 the deaths in Bristol and Clifton were 904 and 726, in Wolverhampton 858 and 704, in Dudley 1,032 and 747, in Birmingham and Aston 1,888 and 1,440. In Coventry the deaths showed little decrease. Of the 94 deaths in the Holy Trinity sub-district "54 are those of children under three years old, the causes of death being generally either 'natural weakness,' 'diarrhœa,' or 'convulsions.'"

The deaths (5,681), except in Rutland, were below the average in the North Midland Counties; namely, in Leicester, Lincoln, Nottingham, and Derby.

In Cheshire and Lancashire the improvement is less extensive than it is in other counties. The deaths were 16,928. The deaths in Liverpool and West Derby, where scarlatina was epidemic, were 3,487, or 327 more than in the last quarter of 1853. The deaths in Manchester and Salford, on the other hand, were 2,396, or 374 less than in 1853. Many deaths from scarlatina occurred in Runcorn. In Knott Lane, Ashton, several deaths occurred among persons who were attended by an unqualified practitioner.

The decrease in the mortality of Yorkshire is considerable; the deaths in the last three months of 1853 were 10,670, in the last three months of the year 1855 they were 9,421. Bradford, Leeds, Sheffield, York, and Hull, exhibit a great diminution in the number of deaths.

The deaths in the Northern Counties, Durham, Northumberland, Cumberland, and Westmorland, were 5,502, and below the average. Scarlatina has been very fatal. It prevailed with much severity in the colliery districts of Durham. The two villages in Easington, in which it was most fatal, are situated very low, on a marshy damp, badly-drained soil. In South Shields district, where many men are employed on the construction of an extensive dock, scarlatina and typhus have prevailed. At Bedlington, Morpeth, small pox has been raging among all classes, affecting both young and old. Those who had not been vaccinated were great sufferers. 14 persons died of Asiatic cholera, 7 of diarrhœa, in Sunderland East; the seat of the first outbreak in 1831.

In Monmouthshire and Wales 5,844 persons died. Scarlatina and typhus attacked some districts; but the mortality was less than in the two previous years.

Upon the whole, the health of England and Wales exhibits evidences of improvement.

Marriages Registered in the Quarters ended 30th September, 1853-55; Births and Deaths Registered in the Quarters ended 31st December, 1853-55, in the Divisions of England.

DIVISIONS.	Area in Statute Acres.	Population, 1851.	Marriages			Births			Deaths		
			Registered in the Quarter ended the last Day of								
			September			December			December		
			1853.	1854.	1855.	1853.	1854.	1855.	1853.	1854.	1855.
England	37,324,915	17,927,609	39,899	38,150	37,151	144,363	146,459	148,853	103,130	109,664	97,119
Divisions.											
I. London	78,029	2,362,236	7,484	6,949	6,974	20,478	19,751	20,859	16,339	17,291	14,262
II. South Eastern Counties	4,065,105	1,628,386	3,028	2,803	2,992	12,429	12,372	12,194	7,943	8,791	8,259
III. South Midland Counties	3,201,290	1,234,332	2,132	1,976	1,901	8,872	9,172	9,355	6,050	7,263	6,353
IV. Eastern Counties	3,214,099	1,113,982	1,674	1,530	1,496	7,519	8,122	7,794	5,075	6,071	5,314
V. South Western Counties	4,994,490	1,803,291	3,338	3,294	2,987	12,526	13,058	12,476	8,488	8,991	8,383
VI. West Midland Counties	3,865,332	2,136,573	5,019	4,906	4,423	17,909	18,294	18,652	12,594	13,611	11,172
VII. North Midland Counties	3,540,797	1,215,501	2,323	2,224	2,114	9,590	9,667	10,039	6,528	6,468	5,681
VIII. North Western Counties	2,000,227	2,488,438	6,704	6,426	6,353	22,463	22,369	22,912	17,847	17,017	16,928
IX. Yorkshire	3,654,636	1,789,047	4,235	3,905	3,842	15,938	15,875	16,153	10,670	11,005	9,421
X. Northern Counties	3,492,322	969,126	1,751	1,884	1,922	7,950	8,830	9,291	5,709	6,280	5,502
XI. Monmouthshire and Wales	5,218,588	1,186,697	2,211	2,253	2,147	8,689	8,949	9,128	5,887	6,876	5,844

On the Meteorology of England and Scotland during the Quarter ended December 31st, 1855. By James Glaisher, Esq., F.R.S., *Sec. of the British Meteorological Society.*

Till 23rd October the daily temperatures of the air were about 2° in excess; from this time till 17th December, excepting the seven days ending 12th November, the temperatures of a very few days reached their average values; the deficiency of several in December exceeded 10°, and on the 19th, 20th, 21st, and 22nd, were from 14° to 19° in defect. The average daily defect of temperature for the sixty days ending 17th December amounted to 4°. The period from 18th December was very warm, and the average daily excess of temperature was as large as 6°.

The pressure of the atmosphere in October was considerably below, in November was much above, and in December was rather below, its average value.

The water mingled with the air was in excess in October and in defect in November and December, particularly in the latter month.

The daily ranges of temperature have been of their average values in each month.

The degree of humidity of the air was somewhat above its average in both October and November, and greatly below it in December, the air having been remarkably dry.

Rain fell in excess in October to the amount of 2 inches, and in defect to the same amount in the two remaining months. The fall of rain about London for twenty-six consecutive months ending December, should be 54¼ inches; the amount collected was 40 inches; so that the deficiency of rain for the period is 14 inches.

The mean temperature of the air at Greenwich for the quarter ended November, constituting the three autumn months, was 50°·2, being 0°·9 above the average of 84 years.

1855. Months.	Temperature of Air. Mean.	Air. Diff. from Average of 84 Years.	Air. Diff. from Average of 14 Years.	Temperature of Evaporation. Mean.	Evaporation. Diff. from Average of 14 Years.	Dew Point. Mean.	Dew Point. Diff. from Average of 14 Years.	Air—Daily Range. Mean.	Air—Daily Range. Diff. from Average of 14 Years.	Water of the Thames.	Elastic Force of Vapour. Mean.	Elastic Force of Vapour. Diff. from Average of 14 Years.	Weight of Vapour in a Cubic Foot of Air. Mean.	Weight of Vapour in a Cubic Foot of Air. Diff. from Average of 14 Years.
	°	°	°	°	°	°	°	°	°	°	In.	In.	Gr.	Gr.
Oct.	51·2	+1·9	+1·5	49·4	+1·7	47·8	+2·5	13·5	−0·3	55·8	·346	+·026	4·0	+0·3
Nov.	41·3	−1·2	−2·7	39·9	−2·6	38·5	−2·0	9·7	−1·1	44·6	·250	−·021	2·9	−0·2
Dec.	35·6	−3·3	−4·9	33·9	−5·1	31·3	−5·5	9·3	+0·2	38·2	·178	−·062	2·1	−0·7
Mean.....	42·7	−0·9	−2·0	41·1	−2·0	39·2	−1·7	10·8	−0·4	46·2	·258	−·019	3·0	−0·2

1855. Months.	Degree of Humidity. Mean.	Degree of Humidity. Diff. from Average of 14 Years.	Reading of Barometer. Mean.	Reading of Barometer. Diff. from Average of 14 Years.	Weight of a Cubic Foot of Air. Mean.	Weight of a Cubic Foot of Air. Diff. from Average of 14 Years.	Rain. Amnt.	Rain. Diff. from Average of 40 Years.	Daily Horizontal Movement of the Air.	Reading of Thermometer on Grass. Number of Nights it was At or below 32°.	Between 32° and 40°.	Above 40°.	Lowest Reading at Night.	Highest Reading at Night.
			In.	In.	Gr.	Gr.	In.	In.	Miles.				°	°
Oct.	89	+ 3	29·527	−·143	531	− 4	4·9	+2·1	106	5	14	12	30·5	55·0
Nov.	92	+ 3	29·864	+·139	548	+ 5	1·3	−1·2	64	14	12	4	20·5	44·0
Dec.	79	−10	29·761	−·071	553	+ 3	1·2	−0·8	116	24	6	1	5·1	40·2
Mean.....	87	− 1	29·717	−·025	544	+ 1	Sum 7·4	Sum +0·1	95	Sum 43	Sum 32	Sum 17	5·1	55·0

Note.—In reading this table it will be borne in mind that the sign (−) minus signifies below the average, and that the sign (+) plus signifies above the average.

Meteorological Table, Quarter ended December 31*st*, 1855.

Names of Stations.	Mean Pressure of Dry Air reduced to the Level of the Sea.	Mean Temperature of the Air.	Highest Reading of the Thermometer.	Lowest Reading of the Thermometer.	Mean Daily Range of Temperature.	Mean Monthly Range of Temperature.	Range of Temperature in the Quarter.	Wind.		Mean Amount of Cloud.	Rain.		Mean Degree of Humidity.
								Mean estimated Strength.	General Direction.		Number of Days on which it fell.	Amount collected.	
	in.	°	°	°	°	°	°					in.	
Jersey	29·642	47·2	64·0	29·0	5·6	20·3	35·0	1·7	Var.	6·4	47	9·0	79
Falmouth	....	47·7	71·0	28·0	9·6	27·7	43·0	1·8	Var.	7·1	50	9·0	...
Truro	29·574	47·0	67·0	21·0	11·3	32·7	46·0	1·3	Var.	7·2	52	10·0	82
Teignmouth	29·607	45·5	64·6	27·0	9·6	26·6	37·6	1·1	S.W. & W.	6·9	53	6·5	85
Exeter	29·604	45·3	65·8	24·0	13·4	31·3	41·8	1·9	N. & W.	5·2	43	6·6	87
Newport	29·609	45·1	67·3	16·1	9·7	32·8	51·2	2·1	N.E. & W.	7·7	40	11·2	86
Clifton	29·618	42·9	64·4	14·1	9·7	33·7	50·3	0·7	Var.	6·6	50	7·5	89
Royal Observatory	29·637	42·7	66·8	16·9	10·8	33·2	49·9	....	S.W. & N.W.	7·5	50	7·4	87
Somerset House	....	46·0	68·3	19·1	15·8	35·1	49·2	....	Var.	....	....	....	86
Oxford	29·628	43·2	64·3	14·6	9·8	32·6	49·7	1·7	N.W. & S.W.	7·7	48	7·7	86
Hartwell Rectory	29·594	42·0	72·5	11·3	9·9	36·9	61·2	1·0	S.W.	5·8	45	6·6	89
Royston	29·648	42·7	71·8	16·2	11·2	32·9	55·6	....	S.W. & N.W.	6·7	73	8·5	88
Lampeter	29·639	42·5	68·8	15·5	....	...	53·3	1·3	Var.	6·8	54	12·0	83
Norwich	29·601	40·3	65·0	20·0	9·6	30·3	45·0	1·3	S.W.	6·5	48	8·9	84
Derby	29·598	42·4	64·0	18·0	11·9	32·3	46·0	....	Var.	....	39	4·4	83
Holkham	29·600	42·9	69·2	17·2	10·3	32·3	52·0	1·4	S.W. & S.E.	7·1	55	10·5	89
Nottingham	29·644	41·8	67·9	12·0	12·2	36·1	55·9	0·5	N.W. & S.W.	7·5	47	6·5	84
Hawarden	29·618	43·5	64·0	16·5	9·6	30·7	47·5	1·5	Var.	7·7	31	5·1	84
Gainsborough	29·611	41·4	65·0	21·0	9·0	29·0	44·0	0·5	Var.	5·7	42	6·2	85
Warrington	29·593	42·3	65·6	14·5	11·6	33·0	51·1	0·4	Var.	6·3	38	6·3	86
Wakefield	29·611	42·1	67·0	12·7	16·5	37·7	54·3	1·5	N.W. & S.W.	7·0	56	6·6	87
York	29·576	40·9	67·5	19·0	9·9	32·0	48·5	....	Var.	....	43	5·0	87
Scarborough	29·556	43·2	59·5	22·2	5·7	22·3	37·3	2·3	S.W. & W.N.W.	....	53	8·2	89
North Shields	29·636	41·7	60·0	22·2	7·6	25·8	37·8	2·2	S.W. & N.W.	6·4	56	5·6	92
Arbroath	29·600	39·4	62·0	19·0	11·9	33·3	43·0	1·1	N.W.	6·8	39	5·5	81

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE (DEPT OF MEDICAL STAFF) KING'S LIBRARY

REVENUE.

An Abstract of the Net Produce of the Revenue of the United Kingdom in the Years and Quarters ended 31st December, 1854 and 1855; showing the Increase or Decrease thereof.—(*Continued from page* 387, vol. xviii.)

Sources of Revenue.	Years ended 31st December.			
	1854.	1855.	Increase.	Decrease.
	£	£	£	£
Customs	20,682,429	21,291,712	609,283	....
Excise	15,901,764	16,763,535	861,771	....
Stamps	6,988,787	6,993,148	4,361	....
Taxes	3,028,384	2,967,742	....	60,642
Property Tax	7,366,588	13,884,114	6,517,526	....
Post Office	1,307,234	1,174,219	....	133,015
Crown Lands	271,572	280,516	8,944	....
Miscellaneous	777,839	1,103,007	325,168	....
Totals	56,324,597	64,457,993	8,327,053	193,657
			Net Increase	£8,133,396

Sources of Revenue.	Quarters ended 31st December.			
	1854.	1855.	Increase.	Decrease.
	£	£	£	£
Customs	5,699,967	5,384,461	....	315,506
Excise	4,391,582	4,444,726	53,144	....
Stamps	1,786,769	1,695,369	....	91,400
Taxes	1,270,408	1,323,114	52,706	....
Property Tax	826,589	1,260,942	434,353	....
Post Office	277,234	293,272	16,038	....
Crown Lands	80,000	85,000	5,000	....
Miscellaneous	178,177	345,317	167,140	....
Totals	14,510,726	14,832,201	728,381	406,906
			Net Increase	£321,475

Increase and Decrease of the Revenue in the Nine Months of the Financial Year, from the 31st March, 1855, to the 31st December, 1855, as compared with the corresponding periods of the preceding year.

Increase.—Customs, 292,938*l.*; Excise, 422,407*l.*; Property Tax, 2,629,477*l.*; Crown Lands, 7,944*l.*; Miscellaneous, 366,549*l.*—*Total Increase*, 3,719,315. *Decrease.*—Stamps, 139,802*l.*; Taxes, 168,401*l.*; Post Office, 159,938*l.* *Total Decrease*, 468,141*l.* *Net Increase*, 3,251,174*l.*

An Account showing the Net Revenue and other Receipts of the Quarter ended the 31st of December, 1855; the Application of the same, and the Charge of the Consolidated Fund for the said Quarter, together with the Surplus or Deficiency upon such Charge.

	£	£
Surplus balance beyond the charge of the Consolidated Fund, for the quarter ended September 30th, 1855, viz.:—		
Great Britain		
Ireland £320,585		320,585
Net Income received in the quarter ended December 31st, 1855, as shown in page 91		14,832,201
Amount received in the quarter ended December 31st, 1855, in full of Loan of £16,000,000		4,021,200
Amount of Exchequer Bills (Supply) issued in the quarter ended December 31st, 1855		800,000
Amount received in the quarter ended December 31st, 1855, in repayment of advances for Public Works, &c.		414,784
		20,388,770
Balance, being the deficiency on the 31st Dec., 1855, upon the charge of the Consolidated Fund in Great Britain, to meet the Dividends and other Charges payable in the quarter to March 31st, 1856, and for which Exchequer Bills (Deficiency) will be issued in that quarter		3,879,750
		£24,268,520

	£	£
Amount applied out of the net income for the quarter ended December 31st, 1855, to redemption of Exchequer Bills (Deficiency) for the quarter ended September 30th, 1855		853,443
Net amount applied out of the Consolidated Fund, to supply services in the quarter ended December 31st, 1855		14,880,590
Charges of the Consolidated Fund for the quarter ended December 31st, 1855, viz.:—		
Interest of the Permanent Debt	6,251,876	
Terminable Debt	668,825	
Interest of Exchequer-Bills (Deficiency)	Nil.	
The Civil List	99,920	
Other charges on Consolidated Fund	363,142	
Advances for Public Works, &c.	238,940	
Loan to Sardinia	500,000	
		8,122,703
Surplus Balance beyond the charge of the Consolidated Fund, for the quarter ended December 31st, 1855, viz.:—		
Great Britain		
Ireland	411,784	
		411,784
		£24,268,520

CORN.

Average Prices of Corn per Imperial Quarter in England and Wales, during each Week of the Fourth Quarter of 1855; *together with the Monthly, Quarterly, and Yearly Average*—(*Continued from p.* 389, vol. xviii.)

[Communicated by H. F. Jadis, Esq., Comptroller of Corn Returns.]

Weeks ended on a Saturday, 1855.	Weekly Average.					
	Wheat.	Barley.	Oats.	Rye.	Beans.	Peas.
	s. *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*
October 6	76 6	37 0	28 7	50 10	48 10	46 2
„ 13	76 7	38 4	28 6	49 8	49 11	48 7
„ 20	76 10	38 10	27 9	50 5	49 10	48 7
„ 27	78 4	38 6	28 8	50 1	51 3	49 9
Average for October	77 0¾	38 2	28 4½	50 3	49 11½	48 3
November 3	80 3	39 0	28 0	51 3	50 8	51 2
„ 10	80 5	39 6	28 4	52 0	51 11	51 4
„ 17	80 10	39 11	28 0	52 10	52 0	50 4
„ 24	82 1	40 11	28 1	52 9	51 10	52 8
Average for November	80 10¾	39 10	28 1	52 2½	51 7	51 4½
December 1	83 1	42 3	28 10	53 0	53 3	52 5
„ 8	81 6	42 5	28 6	53 9	52 3	50 9
„ 15	79 11	41 3	27 10	55 4	51 8	49 1
„ 22	78 9	40 4	27 1	54 6	50 8	48 11
„ 29	77 2	39 4	26 11	54 11	49 0	47 6
Average for December	80 1	41 1	27 10	54 3½	51 4	49 8¾
Average for the Quarter	79 4¾	39 9¾	28 1	52 4¾	51 0	49 9¼
Average for the Year	74 8¾	34 9	27 5¾	45 8	46 6¾	43 4

STOCKS AND SHARES.

Fluctuations in the Stock and Share Markets during the Months of October, November, and December, 1855.—(*Continued from p.* 389, vol. xviii.)

Stocks and Shares.	Amt. of Share.	Amt. Paid.	Price on the			Highest Price during the Months of			Lowest Price during the Months of		
			1 Oct.	2 Nov.	1 Dec.	Oct.	Nov.	Dec.	Oct.	Nov.	Dec.
Consols	...	...	88⅜ to ½	88⅛	88 ex div	88⅝	89⅝	89¼	86¼	87½	87¾
Exchequer Bills	...	...	3*s.* Dis. to 1*s.* Pm	10*s.* to 5*s.* Dis.	6*s.* Dis.	3*s.* Pm.	2*s.* Dis.	2*s.* Dis.	10*s.* Dis.	12*s.* Dis.	10*s.* Dis
Railways.											
Brighton	Stock	100	96	95	95½	96	95½	96	94¼	93½	94
Caledonian	„	100	59	58½	55¾	59¼	58½	56¼	57½	54¾	54⅜
Eastern Counties	„	20	9⅝	8⅞	8⅝	9⅞	9¼	9	9	8¼	8½
Great Northern	„	100	86	84	89	86½	89	89½	81½	83½	87½
Great Western	„	100	55	51	50¼	55¼	52	53¾	50	48½	49¾
London & North-Western	„	100	92	92½	94	93¼	95¾	94½	90⅞	92	93¾
Midland	„	100	65	64	64	65¼	65½	64¾	62½	62⅛	63¾
Lancashire and Yorkshire	„	100	75¾	75¼	77	76⅜	76⅝	77¾	74	74⅜	76¾
North Staffordshire	20	17½	10¼	9¼	9½	10¼	9⅝	9½	9¾	9¼	9⅛
South-Eastern	Stock	100	57½	57	57¾	58	58¼	58¼	56⅝	56⅝	56⅝
South-Western	„	100	82	82½	87¼	83¼	86¾	87½	81	83	85
York, Newcastle, & Berwick	„	100	69	68	68	69½	69	69	67½	67	67¼
York and North Midland	„	100	46	44½	45	46⅛	45½	45	44½	44½	44¾
Northern of France	20	16	35¼	34	36	35¼	35½	36⅛	33⅝	34	35
East Indian	20	20	22⅓	22	21¼	22¾	22¼	21¼	21¾	20¾	20⅞

Fluctuations in the Stock and Share Markets during the Year 1855.

Stocks and Shares.	Amount of Share 31st December, 1855.	Amount Paid 31st December, 1855.	Price in 1855.		Highest Price during the Year.	Lowest Price during the Year.
			1st January.	31st December.		
Consols	.....	.....	$91\frac{1}{8}$	$88\frac{1}{2}$	$93\frac{5}{8}$	$86\frac{1}{4}$
Exchequer Bills	.....	.....	4*s.* to 7*s.* Pm.	6*s.* Dis.	27*s.* Pm.	12*s.* Dis.
RAILWAYS—						
Brighton	Stock	100	107	94	108	$93\frac{1}{2}$
Caledonian	,,	100	61	$54\frac{3}{4}$	$65\frac{3}{4}$	$54\frac{3}{8}$
Eastern Counties	,,	20	$10\frac{7}{8}$	$8\frac{3}{4}$	$12\frac{5}{8}$	$8\frac{1}{4}$
Great Northern	,,	100	$91\frac{1}{2}$	$88\frac{1}{2}$	94	$81\frac{1}{2}$
Great Western	,,	100	$68\frac{3}{4}$	$52\frac{3}{4}$	70	$48\frac{1}{4}$
London and North Western	,,	100	101	$94\frac{1}{4}$	$104\frac{3}{4}$	$90\frac{1}{2}$
Midland	,,	100	$68\frac{3}{4}$	64	$75\frac{5}{8}$	$62\frac{1}{8}$
Lancashire and Yorkshire	,,	100	$73\frac{1}{2}$	77	$84\frac{1}{4}$	74
North Staffordshire	20	$17\frac{1}{2}$	$13\frac{1}{8}$	$9\frac{1}{8}$	$13\frac{3}{8}$	$9\frac{1}{8}$
South-Eastern	Stock	100	59	57	$64\frac{1}{4}$	$56\frac{1}{4}$
South-Western	,,	100	84	85	88	$79\frac{1}{2}$
York, Newcastle, and Berwick	,,	100	$74\frac{1}{2}$	$67\frac{1}{2}$	$77\frac{1}{2}$	67
York and North Midland	,,	100	$52\frac{1}{2}$	45	$54\frac{3}{4}$	$44\frac{1}{2}$
Northern of France	20	16	$33\frac{3}{4}$	$35\frac{1}{2}$	$37\frac{1}{2}$	$33\frac{1}{4}$
East Indian	20	20	$20\frac{3}{4}$	$21\frac{1}{4}$	26	$20\frac{1}{2}$

CURRENCY.

Bank of England.

An Account, pursuant to the Act 7th and 8th Victoria, c. 32, for each Week ended on a Saturday, for the Fourth Quarter of 1855.—(*Continued from p.* 390, vol. xviii.)

[Compiled from the "Bankers' Magazine."]

ISSUE DEPARTMENT.

Date.	Notes Issued.	Notes in hands of Public.	Government Debt.	Other Securities.	Gold Coin and Bullion.	Silver Bullion.
1855.	£	£	£	£	£	£
Oct. 6 ...	25,765,025	20,291,555	11,015,100	2,984,900	11,765,925	...
„ 13 ...	25,205,855	20,648,365	11,015,100	2,984,900	11,205,855	...
„ 20 ...	24,682,230	20,371,745	11,015,100	2,984,900	10,682,230	...
„ 27 ...	24,698,460	20,435,900	11,015,100	2,984,900	10,698,460	...
Nov. 3 ...	24,741,320	20,096,855	11,015,100	2,984,900	10,741,320	...
„ 10 ...	24,646,295	19,763,090	11,015,100	2,984,900	10,646,295	...
„ 17 ...	24,661,760	19,422,230	11,015,100	2,984,900	10,661,760	...
„ 24 ...	24,543,545	19,050,900	11,015,100	2,984,900	10,543,545	...
Dec. 1 ...	24,580,570	19,075,085	11,015,100	2,984,900	10,580,570	...
„ 8 ...	24,439,525	18,680,340	11,015,100	2,984,900	10,439,525	...
„ 15 ...	25,137,985	18,581,360	11,015,100	2,984,900	10,662,985	...
„ 22 ...	24,844,595	18,379,890	11,015,100	2,984,900	10,369,595	...
„ 29 ...	24,664,465	18,700,615	11,015,100	2,984,900	10,189,465	...

BANKING DEPARTMENT.

Date.	Proprietors' Capital.	Rest.	Public Deposits.	Other Deposits.	Seven Day and other Bills.	Total Dr.
1855.	£	£	£	£	£	£
Oct. 6 ...	14,553,000	3,682,448	7,106,524	10,837,643	1,012,547	37,192,162
„ 13 ...	14,553,000	3,147,899	4,359,851	11,905,925	973,867	34,940,542
„ 20 ...	14,553,000	3,161,093	3,825,021	11,764,080	980,139	34,283,333
„ 27 ...	14,553,000	3,170,726	3,700,844	11,327,321	979,129	33,731,020
Nov. 3 ...	14,553,000	3,178,169	3,369,984	11,694,200	964,250	33,759,603
„ 10 ...	14,553,000	3,208,583	3,605,358	11,166,069	942,750	33,475,760
„ 17 ...	14,553,000	3,220,897	4,110,130	10,886,746	982,219	33,752,992
„ 24 ...	14,553,000	3,236,502	4,798,954	11,529,385	962,483	35,080,324
Dec. 1 ...	14,553,000	3,185,588	4,439,589	12,234,788	883,294	35,296,259
„ 8 ...	14,553,000	3,193,028	4,416,231	11,719,180	923,444	34,804,883
„ 15 ...	14,553,000	3,205,482	4,428,440	12,322,462	846,731	35,350,115
„ 22 ...	14,553,000	3,219,877	5,344,753	12,241,457	851,088	36,210,175
„ 29 ...	14,553,000	3,235,328	5,843,932	12,362,512	802,908	36,797,680

Date.	Government Securities.	Other Securities.	Notes.	Gold and Silver Coin.	Total Cr.
1855.	£	£	£	£	£
Oct. 6 ...	11,413,143	19,791,293	5,473,470	514,256	37,192,162
„ 13 ...	10,556,040	19,280,446	4,557,490	546,566	34,940,542
„ 20 ...	10,635,359	18,789,512	4,310,485	547,977	34,283,333
„ 27 ...	10,328,955	18,534,600	4,262,560	604,905	33,731,020
Nov. 3 ...	10,201,276	18,355,548	4,644,465	558,314	33,759,603
„ 10 ...	10,124,848	17,879,564	4,883,205	588,143	33,475,760
„ 17 ...	10,124,848	17,787,150	5,239,530	601,464	33,752,992
„ 24 ...	10,339,848	18,651,439	5,492,645	596,392	35,080,324
Dec. 1 ...	10,275,480	18,868,757	5,505,485	646,537	35,296,259
„ 8 ...	10,264,376	18,141,269	5,759,185	640,053	34,804,883
„ 15 ...	9,789,376	18,360,761	6,556,625	643,353	35,350,115
„ 22 ...	9,929,197	19,204,123	6,464,705	612,150	36,210,175
„ 29 ...	10,425,292	19,777,860	5,963,850	630,678	36,797,680

CURRENCY.—*Continued.*

Country Banks.

Average amount of Promissory Notes in Circulation in England and Wales in each Week ended on a Saturday, for the Fourth Quarter, of 1855.—(*Continued from page* 392, vol. xviii.)

[Compiled from the "Bankers' Magazine."]

England and Wales.

Date.	Private Banks.	Joint Stock Banks.	Total.
1855.	£	£	£
Oct. 6	4,018,346	3,157,579	7,175,925
,, 13	4,119,285	3,209,021	7,328,306
,, 20	4,114,407	3,175,321	7,289,728
,, 27	4,043,630	3,096,231	7,139,861
Nov. 3	4,039,634	3,107,303	7,146,937
,, 10	4,009,000	3,132,543	7,141,543
,, 17	3,957,991	3,128,548	7,086,539
,, 24	3,921,017	3,113,620	7,034,637
Dec. 1	3,876,422	3,096,089	6,972,511
,, 8	3,844,093	3,066,914	6,911,007
,, 15	3,830,617	3,035,462	6,866,079
,, 22	3,820,822	3,034,196	6,855,018

Fixed Issues—Private Banks, £4,600,718; Joint Stock Banks, £3,325,857.

Average amount of Promissory Notes in Circulation in Scotland and Ireland during the Four Weeks ended the 29th of September, the 27th of October, the 24th of November, and the 22nd of December, 1855.—(*Continued from page* 392, vol. xviii.)

Scotland.

Date.	£5 and above.	Under £5.	Total.
1855.	£	£	£
Sept. 29	1,437,315	2,656,788	4,094,106
Oct. 27	1,579,270	2,723,060	4,302,335
Nov. 24	1,638,343	2,909,654	4,547,997
Dec. 22	1,548,504	2,852,255	4,400,763

Ireland.

Date.	£5 and above.	Under £5.	Total.
1855.	£	£	£
Sept. 29	2,877,766	3,022,245	5,900,012
Oct. 27	3,240,874	3,547,738	6,788,615
Nov. 24	3,244,210	3,720,164	6,964,375
Dec. 22	3,159,896	3,883,381	7,043,279

Fixed Issues—Scotland, £3,087,209; Ireland, £6,354,000.

ERRATA.

In page 158, line 8 from bottom, *for* 1825 *read* 1845.

,, line 7 from bottom, *for* sixty *read* eighty.

QUARTERLY JOURNAL

OF THE

STATISTICAL SOCIETY.

JUNE, 1856.

Twenty-second Anniversary Meeting of the Statistical Society. Session 1855–56.

[Held at No. 12, St. James's Square, London, Saturday, 15th March, 1856.]

LORD HARRY GEORGE VANE, M.P., *in the Chair.*

THE Circular convening the Meeting having been read and confirmed, Dr. Guy, one of the Honorary Secretaries, read the following Report of the Council on the progress of the Society during the past year:—

Report of Council.

The Council of the Statistical Society, in reporting the proceedings of the Session 1855-56 have, in the first place, to acknowledge the honour done to the Society, and the advantage conferred upon it, by the attendance of its Patron, His Royal Highness Prince Albert, at the ordinary Meeting on the 18th of June, 1855. On that occasion, as in the year 1849, when the Society had the honour of receiving a similar visit, His Royal Highness was pleased to evince great interest in the proceedings of the Society, and to take part in the discussion.

The Session 1855-56 has also been distinguished by an unusual addition to the number of its Members. As many as 48 new Members have been elected; and as the losses sustained by deaths and resignations, and by defaulters, only amount to 18, there is a permanent addition to the Society of 30 Members. The Council attribute this increase of Members partly to the better appreciation on the part of the public of the objects of the Society, partly to the growing sense of the necessity of statistical information, and partly to the exertions of Members in making known to their friends the advantages which the Society offers, and the very moderate terms upon which those advantages may be secured.

The Society now consists of 382 Members, of whom 313 are annual subscribers, and 69 have compounded. The largest number of Members at any time enrolled on the books of the Society is 435. It is to be hoped that the causes which have contributed to the recent increase will continue in operation till this maximum is again attained, or even exceeded.

The income of the Society for the year ending December 31,

1855, including the balance in hand at the beginning of the year, amounts, within a few shillings, to the income similarly calculated of the year preceding. The items, however, of which the incomes of the two years consist differ widely; the sales of the Journal and Index, which in the year 1855 fell short of those of 1854 by upwards of 100*l.*, being compensated by an increase of nearly equal amount in the subscriptions and compositions.

The expenditure for the year 1855 was in excess of the income by upwards of 30*l.*; and the balance in hand stands also at a lower figure than usual. This excess of expenditure and reduction of the balance in hand, are explained by the payment to the Society's printer of the sum of 60*l.* for the September Journal, so as to leave, for the first time for many years, no liability under this head.

The liabilities of the Society, which amounted to 325*l.* in 1852, to 135*l.* in 1853, and to 111*l.* in 1854, were increased, at the beginning of this year, to 166*l.* More than half of this sum is chargeable to the new Catalogue and the painting and decoration of the Society's rooms. But for these unusual items of expenditure, which will not recur, the liabilities of the Society would have again decreased; and there is every reason to believe that at the end of the current year the liabilities will again become subject to the old law of progressive decrease. The sum of 166*l.* being now paid, the Society is free from liability.

The Society's Library, which was greatly improved in appearance last year by the binding of an unusual number of volumes, and by the re-arrangement of the books, consequent on the compilation of the Catalogue, has received several considerable additions. Among the principal donors the Council have great pleasure in mentioning the name of their former Honorary Secretary Mr. Rawson W. Rawson, and the names of Dr. Farr, Dr. Berg, and the Baron Czoernig.

Dr. Berg was elected a Foreign Honorary Member during the last year, in company with M. Maurice Block, Sous-chef du Bureau de la Statistique Générale de France, and M. Xavier Heuschling, Secretary of the Central Commission of Statistics in Belgium.

The Council announce, with extreme regret, the loss which they have sustained during the past year by the deaths of the Duke of Somerset, one of the original Members of the Society, of Sir William Molesworth, our late Colonial Minister, and of Lord Wharncliffe, who had but recently been elected a Member of the Society and of the Council.

A change has also taken place in the Society's staff in consequence of the resignation of Mr. Edward Cheshire, our late Assistant-Secretary, to whom the Council have had the pleasure of expressing their sense of the great value of his services. Mr. Edward Tudor Scargill has been appointed in his stead.

The papers read at the Ordinary Meetings of the Society have possessed, at least, their usual amount of interest, and have fairly sustained the reputation of the Society. The paper by Mr. Hodge "On the Mortality arising from Naval Operations," deriving an interest from the war in which we are engaged no less than from the very able and complete manner in which the subject was treated, was read on the evening of the visit of His Royal Highness Prince

Albert. Colonel Sykes's paper "On the External Commerce of India," so lately read, illustrated in a very striking manner the absorption of silver which has been going on in India for so many years, and has reached so considerable an amount. Mr. Babbage's subtle "Analysis of the Statistics of the Clearing House," and Mr. Gilbart's able "Retrospect of London Banking;" Mr. Locke's paper "On the Mining Resources of France," and Mr. Hunt's paper "On the present state of the Mining Industries of the United Kingdom," form a valuable series of treatises on Economic Statistics. The Rev. Robert Everest has favoured the Society with a paper "On the Distribution of Emigrants from Europe over the surface of the United States;" and Dr. Guy, in a paper "On the Nature and Extent of the Benefits conferred by Hospitals on the Working Classes and the Poor," has discussed questions of considerable interest to all the supporters of hospitals and other charitable institutions. Lastly, Mr. Leone Levi has favoured the Society with the same complete "Résumé of the Proceedings of the Statistical Congress at Paris" as he did two years since of the Congress held at Brussels. In addition to these papers, which have been printed in the Society's Journal, several valuable contributions have been received from the Statistical Section of the British Association, held at Glasgow last September. This section, it may be observed in passing, was unusually well attended, and was proportionately successful.

Nearly contemporaneously with this Congress of scientific men from all parts of the world there was held at Paris a Congress devoted exclusively to statistics. The Society was represented at this Congress by Viscount Ebrington and the Rev. E. Wyatt-Edgell, and by Mr. Leone Levi, who so lately gave to the Society an account of its proceedings. Among the most important results of this gathering of the statists of all countries for one common purpose, the Council have to notice with special satisfaction the steps taken to hold, during the current year, a Congress first designated a *Congrès de Charité*, and more recently a *Congrès de Bienfaisance*. The place selected for holding this Congress is Brussels, and the date fixed is the 15th of September. In consequence of a communication which M. Ducpètiaux, to whom the task of organizing this Congress has been assigned, has had with Dr. Farr, the Council has had its attention directed to the expediency of promoting the objects of this Congress by appointing a Committee to collect information on the subject of the Beneficent Institutions of England, but especially of the Metropolis. This Committee, which consists of the Earl of Shaftesbury, who has kindly consented to act as Chairman, of Lord Stanley, Dr. Farr, Mr. Horace Mann, Mr. Tottie, and the Honorary Secretaries, has already met, and made arrangements for carrying into practical effect the views of the Council. As the Members of the Society are in possession of the plan of the Committee, it is not necessary to enter into further explanations on the present occasion. The Council, however, would avail themselves of this opportunity to invite the co-operation of every Member of the Society in this very useful work, and will feel grateful for any information which they may be able to afford, especially in respect of the less considerable and least known of the beneficent institutions and societies of London.

By the meeting of the Congress in September the Council hope that the Committee will have made some progress with their inquiry, and will be ready to place before the English public, and to present to their friends in Brussels, some interesting and instructive results.

Mr. Newmarch, another of the Honorary Secretaries, then read the Balance Sheet of Assets and Liabilities.

Mr. William Tayler moved the adoption of the Report and of the Abstract of Receipts and Payments, and Balance Sheet of Assets and Liabilities.

Mr. Barker seconded the motion, which was carried unanimously.

Mr. Newmarch then moved—

"That the Ordinary Meetings of this Society be held hereafter on Tuesday evenings instead of on Monday evenings,"

Stating, that Monday evenings were inconvenient for those Fellows of the Society who were members of either House of Parliament, and that the alteration proposed had the sanction of the Council.

Mr. R. Monckton Milnes, M.P., seconded the motion, which was carried unanimously; the change to take place at the beginning of next Session.

A ballot was then taken for the President, Council, and Officers, for the year ensuing, and the following was declared to be the List:

President.

The Right Hon. the Earl of Harrowby.

Council.

*Charles Babbage, Esq., M.A., F.R.S.
James Bird, M.D.
Sir John Peter Boileau, Bart., F.R.S.
William Farr, Esq., F.R.S.
The Right Hon. The Earl Fitzwilliam, K.G., F.R.S.
James William Gilbart, Esq., F.R.S.
William Augustus Guy, M.B.
The Right Hon. The Earl of Harrowby
*Frederick Hendriks, Esq.
James Heywood, Esq., M.P., F.R.S.
*William Barwick Hodge, Esq.
Thomas Hodgkin, M.D.
Charles Jellicoe, Esq.
William Golden Lumley, Esq., B.C.L.
The Right Hon. Holt Mackenzie, F.G.S.
Herman Merivale, Esq.
Horace Mann, Esq.
William Newmarch, Esq.
*William Drummond Oswald, Esq.
The Right Hon. Lord Overstone
The Right Rev. The Lord Bishop of Oxford, F.R.S.
The Right Hon. Sir John Somerset Pakington, Bart., M.P.
*George Kettilby Rickards, Esq.
*The Right Hon. The Earl of Shaftesbury
Robert Aglionby Slaney, Esq.
The Right Hon. Lord Stanley, M.P.
Colonel W. H. Sykes, F.R.S.
Thomas Tooke, Esq., F.R.S.
John Willam Tottie, Esq.
Lord Harry George Vane, M.P.
The Rev. E. Wyatt-Edgell

* *Those marked thus are New Members.*

Treasurer.

William Farr, Esq., F.R.S.

Honorary Secretaries.

William Augustus Guy, M.B. | William Newmarch, Esq.
William Golden Lumley, Esq.

Professor Rickards moved, and Mr. Hendriks seconded, a vote of thanks to the retiring President, Council, and Officers.

Dr. Whewell moved, and Mr. Lodge seconded, a vote of thanks to the Chairman, and the Meeting separated.

Abstract of Receipts *and* Payments *for the Year ended the* 31*st of* December, 1855.

RECEIPTS.	£	s.	d.
Balance brought forward (less debit balance of Petty Cash).	73	12	11
Arrears 14 Subscriptions, at 2 guineas	29	8	0
Subscriptions for 1855—289 at 2 guineas	606	18	0
Dividends	25	5	6
Compositions—3 at 20 guineas	63	0	0
Journal Sales (including Index Sales, £23 5*s.*)	88	4	10
Institute of Actuaries (Rent)	75	0	0
Sundries	2	18	0
	£964	7	3

PAYMENTS.	£	s.	d.
Rent	150	0	0
Salaries	212	10	0
Journal — Printing (5 Parts) £294 6 8; Advertising 32 16 8; Compiling Index 4 4 0	331	7	4
Catalogue	45	0	0
Library	32	7	10
Stationery and Printing	41	18	4
Postage and Receipt Stamps	18	11	8
Firing and Lighting	15	1	11
Ordinary Meetings	21	15	2
Office Furniture	39	6	4
Miscellaneous	24	15	3
Balance carried forward (after deducting debit balance of Petty Cash)	31	13	5
	£964	7	3

Balance Sheet of Assets *and* Liabilities *on the* 31*st of* December, 1855.

ASSETS.	£	s.	d.
Cash Balance in Bank (after deducting debit balance of Petty Cash)	31	13	5
Stock, New 3 per Cents., £569 17*s.* 0*d.*, cost	567	0	0
Stock, 3 per Cent. Consols, £328 15*s.* 4*d.*, „	300	0	0
Office Furniture, Fixtures, &c., (exclusive of Library)	100	0	0
Arrears 10 Subscriptions, at 2 guineas	21	0	0
	£1,019	13	5

LIABILITIES.	£	s.	d.
Printing of Journal for December, 1855	64	5	10
Carpenter	36	0	5
Painting (deducting £8 8*s.* 0*d.* to be paid by Institute of Actuaries)	28	12	0
Floor Cloth and Dyeing	17	4	6
Stationery and Printing	12	0	0
Miscellaneous	8	1	7
Balance in favour of Society	853	9	1
	£1,019	13	5

Examined and approved—

(Signed) W. B. Hodge, Fredk. Hendriks, John Wm. Tottie, Auditors.

12, St. James's Square, London,
1*st February*, 1856.

Localities of Crime in Suffolk. By Mr. John Glyde, Jun., *Ipswich.*

[Read before the Statistical Section of the British Association, at Glasgow, on Thursday, the 13th of September, 1855.]

Suffolk, the county whose criminality we have carefully examined, is situated in the Eastern District of England, and is one of the largest of English shires. It must be classed as one of our best agricultural counties, although partly maritime, having nearly fifty miles of sea coast. In 1851 it had 69,282 inhabited houses, 71,451 separate occupiers, and 337,215 persons. It had 238 persons and 47 houses to a square mile, 28 acres to every 10 persons, and about 28 per cent. of its population was located in towns.

To trace the progress of crime is a matter of no slight difficulty. Statistical returns, comparing the number of prisoners at different periods, are open to many fallacies, and until we get a register of offences we must consider the criminal returns as a very uncertain test of the comparative morality at different periods. We shall, therefore, make no attempt in this article to indicate the progress of crime in Suffolk further than to state that at the commencement of the century this county stood in a favourable aspect, and that since 1801 crime has increased within its boundaries more rapidly than in the adjoining counties.

Leaving the nature, extent, and fluctuations of crime for more learned observers, we propose opening a new field of inquiry. By analysing the calendars for the five years ending 1853 we descend into particulars, and ascertain the localities in which the criminals have *resided*, and by tracing the prisoner to his home, the operation of the great producing causes of crime will be the more easily seen, and cause and effect, in many instances, be brought face to face.

Suffolk is divided into seventeen poor law unions, two only of which are town districts. As tables of crime for all England include counties of very various degrees of criminality, so does the average for the county of Suffolk include districts, towns, and villages of opposite moral tendencies as developed by their criminal aspects.

The following table exhibits the population of the Suffolk districts and the proportion of prisoners to population in each of the poor law unions, showing, at one view, how the respective unions stand in the order of criminality. The least criminal is placed at the top of the list, the others, increasing in crime, downwards.

There are striking differences exhibited in this table. Criminal tendencies are widely spread in some districts, and a glance at some of the previous calendars proved to us that this tendency is not, by any means, confined to the five years examined, but would, in some cases, be more strongly marked by embracing a larger number of years. Our attention is immediately arrested by the fact of some "unions" being far less criminal than others. Criminals are nearly *three* times as numerous in Cosford as they are in Mutford, and nearly twice as numerous in Hartismere as they are in Mildenhall.

Unions.	Population in 1851.	Ratio of Criminals to Population.
Mutford	20,163	1 in 1,344
Mildenhall	10,354	1 ,, 1,207
Samford	12,493	1 ,, 1,086
Plomesgate	21,477	1 ,, 895
Risbridge	14,059	1 ,, 760
Blything	27,883	1 ,, 871
Thingoe	19,014	1 ,, 760
Woodbridge	23,776	1 ,, 820
Hoxne	15,900	1 ,, 781
Stow	21,110	1 ,, 752
Bosmere	17,219	1 ,, 688
Sudbury	23,406	1 ,, 680
Ipswich	32,759	1 ,, 643
Hartismere	19,028	1 ,, 620
Wangford	14,014	1 ,, 590
Cosford	18,107	1 ,, 464

It must not be supposed that every town and village in these "unions" is equally favourable or unfavourable. The extremes are sometimes met with in the same district. Mutford stands as the least criminal in the list of unions, but its position will appear much more favourable if we subtract the criminals furnished by the town of Lowestoft. In the five years ending 1853 Mutford has furnished 75 prisoners, but 58 of these come from Lowestoft, thus leaving only 17 criminals in that period for the rest of the union, which, independent of the town named, contains 13,382 persons. Again, Wangford has furnished 117 criminals, but of this number the towns of Beccles and Bungay have sent 97, thus leaving 20 prisoners for all the villages in Wangford union. But if we turn to the Cosford union, and deduct the population of the town of Hadleigh, which is the *only* place in the union having a population of more than 2,000 persons, we shall find that the deduction makes but little difference in the ratio of crime. Cosford furnished 196 prisoners, and of this number the town of Hadleigh sent 46, leaving 150 for the rest of the union. Leaving out the towns of Lowestoft, Beccles, Bungay, and Hadleigh, the ratio is in Mutford 1 criminal to every 3,977 persons, in Wangford 1 to every 1,443 persons, and in Cosford 1 to every 492 persons.

Towns, we all know, contain elements of moral progress nowhere else to be found; but as the great mass of offenders tried at assizes and quarter sessions are members of the labouring class, the highest ratio of offenders must be anticipated where labourers aggregate together. This at once points to towns as being, in all probability, more criminal than rural districts. In the towns of Suffolk there is as much difference in comparative criminality as we have shown to exist in entire poor law unions, as the following figures will show:—

Towns.	Population in 1851.	Ratio of Criminals to Population.
Southwold	2,109	1 in every 1,320
Framlingham	2,450	1 ,, 1,020
Debenham	1,653	1 ,, 555
Ipswich	32,914	1 ,, 557
Lowestoft	6,580	1 ,, 565
Sudbury	6,043	1 ,, 475
Hadleigh	3,338	1 ,, 405
Bungay	3,841	1 ,, 370
Halesworth	2,529	1 ,, 309

Great differences in small areas are here exhibited, and this table also shows that the aggregation in towns, is not, in all cases, a sure producer of crime. Stowmarket, the only town in the union which bears its name, was less criminal than the whole district to which it belongs. Framlingham was equally favourable. Southwold and Halesworth, towns nearly equal in population, and situated within a few miles of each other, stand singularly as the least and most criminal in the county; there being 4 criminals in the latter to 1 in the former. Lowestoft is twice as criminal as Southwold, and they are both sea ports: and in proportion to population the criminals from Bungay are double those from Stowmarket, and those from Eye double those from Framlingham.

Are the towns as different for the *heinousness* as they are for the amount of their criminality? This question will naturally suggest itself to the reader, and we are glad to be able to show that a very large per centage of petty larcenies are committed by town residents, and that a less number of the gravest offences are committed by them than could fairly be anticipated. The per centage of larcenies in the following towns in the five years ending 1853 has been as under—

Towns.	Per Centage of Larcenies.	Towns.	Per Centage of Larcenies.
Southwold	50,000	Lowestoft	75,862
Framlingham	58,222	Halesworth	65,853
Debenham	60,000	Hadleigh	60,826
Ipswich	63,050	Bungay	61,538

The small per centage of larcenies at Framlingham and Southwold is owing to the small number of offences, only 12 at the former and 8 at the latter in five years. Debenham appears to stand as bad as Hadleigh, but this also is attributable to the small number of criminals in one town compared with the other.

One of the most interesting fields of inquiry in connection with this subject is the comparative criminality of town and rural districts. The unions varied from 1 criminal in every 1,344 persons to 1 in

every 464 persons. The towns likewise varied from 1 in every 1,320 persons to 1 in 309. Our analysis, however, convinced us that many villages in this county furnish a much larger proportion of prisoners than the towns. Compare the county town Ipswich with the village of Wickham Market, in the Plomesgate union. Ipswich contained 32,750 persons, and Wickham Market 1,697 persons. The great facilities that a large town naturally affords to a practised thief would lead any one to suppose that criminals would abound much more in the former than in the latter, but the examination proved the very reverse to be the fact. During the five years ending 1853 Ipswich had furnished 1 criminal to every 557 persons, whilst Wickham Market had sent 1 criminal to every 339 persons.

To test still further the accuracy of this comparison we took the fifteen towns in Suffolk and compared their criminal returns with fifteen villages from different poor law unions in the county, and the result is—

That fifteen *towns*, each with an average population of 5,000, furnished 1 criminal annually to every 593 persons.

That fifteen *villages*, each with an average proportion of 820, furnished annually 1 criminal to every 317 persons.

Feeling that if we stopped here the comparison between the criminality of town and country would be very imperfectly exhibited, as the *character* of the offences committed by the respective populations would be entirely overlooked, we instituted a more minute and extended analysis for the purpose of showing whether the town or the country population have manifested the most serious phases of the criminal character. Having taken the residences of 228 prisoners, committed for trial for the gravest offences in the calendar, we felt that for this one county the number was amply sufficient to prove the point in question. Of the 228 prisoners 76 were committed for arson, 57 for burglary and housebreaking, 24 for murder, 12 for maliciously wounding, 14 for stabbing and shooting with intent, 12 for rape, 7 for unnatural offences, 1 for sodomy, 16 for assault with intent, 5 for beastiality, and 4 for highway robbery. These are offences which have their origin in malice, unbridled passions, and a lawless disregard of the rights of property; and a better index to the degree of criminal debasement in the town and country districts, than such a comparison will afford, could not well be offered. Of the 228 prisoners 38 only were residents in towns, and the remaining 190 belonged to the villages of Suffolk: 17 per cent. belonged to the former and 83 to the latter. It may be objected that the large proportion of cases of arson, which is essentially a rural offence, included in the above list of offences would materially influence the per centage of country offences. Admitting that there is some force in this objection, it is somewhat strange, considering the mass of agricultural labourers there are residing in the small towns of this county, that out of 76 offenders for the demoniacal crime of arson only 4 of the criminals were town residents. We append the facts in detail:—

Offences.	Total Offenders.	Town Residents.	Country Residents.
Murder	24	5	19
Maliciously cutting, &c.	12	3	9
Stabbing, shooting with intent, &c.	13	3	11
Highway robbery	4	2	2
Burglary and housebreaking	57	16	41
Arson	76	4	72
Rape	13	4	9
Assault, with intent	16	1	15
Unnatural offences	7	....	7
Sodomy	1	....	1
Beastiality	5	....	5
Total	228	38	190

It must be admitted that this analysis is exceedingly favourable to the town residents, for although consisting of nearly 29 per cent. of the population, they have furnished only 17 per cent. of the serious crime of the county. In the class of crimes committed under the influence of sexual animalism only 5 offenders out of 42 belonged to towns.

We respectfully solicit the attention of statistical inquirers to the facts we have brought forward, and earnestly hope that some five or six gentlemen will make the experiment in mining, manufacturing, and agricultural counties, so as to ascertain whether the same differences in the ratio of criminals exist therein, and whether the town populations are, in all cases, so free from committing those grave offences that form the most serious blots on the moral character of the present age.

It must, however, be borne in mind by all who undertake similar inquiries that it is with the *residence* of criminals only, *not* with the place where the offence was committed, that the inquiry has to do.

The External Commerce of British India during two periods of years; namely, the eight years (ended 30th April) 1834-35 to 1841-42, and the five years 1849-50 to 1853-54. By Colonel Sykes, F.R.S.

[Read before the Statistical Society, 21st January, 1856.]

I.—*Early Trade of India.*

At a period when the ancestors of the present mighty English people were painted savages, and the thinly spread population of Western Europe were in but a little more advanced condition, India was densely peopled, civilized, advanced in the arts, and producing all that could administer to the support, the comfort, or the luxury of life. As civilization progressed in the West, wants multiplied, a knowledge of neighbouring countries increased, and at last, through the Greeks and Romans, that knowledge extended to an acquaintance with India. But it may be a question whether a commercial intercourse of any extent existed until the Romans had conquered Egypt, and subsequently eagerly and periodically sought the products of India by visits to the Malabar Coast. The silks, gold brocades, cotton fabrics, diamonds, pearls, works of art, dyes, pepper, cinnamon, and condiments, in fact, every product of India was an object of desire to European nations.

But as all commerce between different countries is founded upon, and can only exist by a reciprocal interchange of commodities, Europeans experienced at that early period the difficulty that exists to this day, of paying for the products of Indian industry,—a difficulty which the constantly increasing wants of Europe, then and now enhanced, and is still enhancing. In other words, the balance of trade was, and is always, in favour of India.

Europe produced few manufactured articles, or raw produce, which the Indians would receive for their valuable commodities; and Europe, therefore, to a great extent, was necessitated to pay for the products of India by bullion or coin. Pliny, in consequence, calls India the "sink of the precious metals;" and judging from the returns of the Indian custom-houses since the commencement of the present century, India is not less the sink now of the precious metals than it was in Pliny's time. A curious illustrative proof of the Roman commercial obligations with India being discharged, to a considerable extent, in the precious metals, came to light a few years since on the Malabar coast. Roman coins had been found in different localities in the Madras Presidency, 500 in the Coimbatore district in 1842, and even on the heights of the Neilgherras and elsewhere, indicating the early existence of some kind of intercourse with Europe; but these discoveries led to no other conclusion than that the coins were conveyed to India by travellers. In the year 1851,* however, it became known that some poor labourers excavating a hill in search of gold dust near to Kottayem, a village about 10 miles from Cannanore, had fallen upon a deposit of Roman gold coins. At first the discovery was kept secret; but the coins being offered for sale in large numbers led to inquiry, and

* Journal of the Asiatic Society of Bengal for 1851, p. 371.

it was stated that as many as five cooly loads had been dug out of the same spot, the great mass of which had reached the hands of jewellers, and been melted down, but some hundreds were secured by the Rajah of Travancore, General Cullen, and others; and General Cullen, at my request, was so obliging as to present a dozen of these coins to the Museum of the India House, where they can now be seen. The coins are of pure gold, and the impressions are so sharp and clear, that they appear as if recently from the mint. They bear the effigies of the Roman Emperors from Augustus down to Antoninus Pius.

After the decline of the Roman Empire the Genoese and Venetians engaged in the Indian trade, and so successfully and profitably as to occasion the designation of "La Superba," to the capital of the Genoese and "Queen of the Adriatic" to that of the Venetians. The discovery of the route to India by the Cape of Good Hope at the end of the fifteenth century struck a paralyzing blow at this overland trade, but the triumphs of science in the nineteenth century bid fair to restore that channel of communication which it was long supposed was interrupted for ever.

II.—*Period of Eight Years,* 1834-5 *to* 1841-2.

With these preliminary observations I shall proceed, from official tables, to demonstrate the amount of the commerce of India,—the fact of the balance of trade being constantly in favour of India:—and the still more remarkable fact of the constant absorption of the precious metals by India.

In 1845 I had a series of commercial tables drawn up, having for some years previously had misgivings in my mind of the accuracy of the popular belief, that the industry of India was being crushed by the influx of British manufactures, and that the annual cash necessities of the East India Company, amounting to between three and four millions sterling, for the payment of interest on the Company's capital, military and civil pensions, military stores, &c., compelling a remittance from India, were exhausting the country and ruining equally India and the East India Company. The annual cash supply has usually been denominated "Indian Tribute." The tables embraced the exports and imports from and to India to all parts of the world from the year 1834-5 to 1841-2, under the respective heads of the chief exports and imports of the different Presidencies, together with separate returns of the export and import of the precious metals for each of the seven years. The exports were classed under coffee, cotton, ivory, shawls, and piece goods, raw silk, sugar, opium, grain, pepper, wool, and sundries. The imports were classed under apparel, books and stationery; cotton, cotton and silk piece goods; drugs and medicines, jewellery, beads, &c.; liquors, wine, &c.; naval stores, provisions, spices, pepper, &c.; woollens, wool, beetel nuts, cochineal, elephants' teeth, raw silk, indigo, grain, fruits, cocoa nuts, &c.; tea, sugar, coffee, gums, metals, glassware, and sundries. Without entering into the details of these tables, which will be reserved for those of a more recent date, it will suffice to state that the exports from Bengal increased from 4,519,812*l.* in 1834-5, to 8,440,880*l.* in 1841-2, or 86·76 per cent.; of Madras from 1 669,133*l.* to 2,256,072*l.*, or 35·16 per cent.; and of Bombay from 3,485,783*l.* to 5,323,904*l.*, or 52·73 per cent. in the same periods.

The total Exports of the three presidencies increased from 9,674,728*l.* to 16,020,857*l.*, or 65·59 per cent.

The Imports into Bengal, (exclusive of bullion,) *increased* from 2,192,557*l.* in 1834-5 to 4,677,387*l.* in 1841-2, or 113·33 per cent.; into Madras, from 977,195*l.* to 1,052,469*l.*, or 7·70 per cent.; and into Bombay, from 2,713,555*l.* to 3,914,628*l.*, or 44·26 per cent., in the same period.

The NET Import of Bullion into Bengal rose from 579,669*l.* in 1834-5 to 1,178,438*l.* in 1841-2. The net bullion imports and exports at Madras were of a comparatively limited character: the *Net* imports in 1834-5 amounted only to 46,637*l.*; rose the next year to 81,231*l.*, but in 1838-9 fell to 39,896*l.*, and in the three following years the net export of bullion exceeded the import, and in 1841-2 amounted to 112,920*l.*

At Bombay, on the contrary, as at Bengal, there was an annual *Net* excess of Bullion imported. In 1834-5 the Net excess amounted to 1,144,770*l.*, and in 1841-2 to 650,189*l.*

The total results of these eight years for all India were as follows:—

The Total Imports, *inclusive* of bullion, rose from 7,654,485*l.* in 1834-5 to 11,473,113*l.* in 1841-2, or 49·88 per cent. The Total Exports, *inclusive* of bullion, rose from 9,674,728*l.* in 1834-5 to 16,020,857*l.* in 1841-2, or 65·59 per cent. Consequently the excess of exports, or, in other words, the balance of trade in favour of India rose from 2,020,242*l.* in 1834-5 to 4,547,744*l.* in 1841-2, or 125·10 per cent. These eight years' trade statements do not include the value of military stores sent to India for the service of Government, and averaging 292,115*l.* per annum.

The aggregate of the value of the trade for these eight years was, goods imported 61,211,044*l.*; of goods exported, 108,052,293*l.*; and, consequently, there was a balance in favour of India, or debt due to it of 46,841,248*l.* This was partly liquidated by a *net* import of bullion of 15,184,720*l.*, leaving an unpaid trade debt of 31,656,528*l.* The India Company sent out military stores in those eight years to the value of 2,336,924*l.*, leaving a debt still due to India of 29,319,604*l.*, which could only have been liquidated by further bullion exports, had not the annual pecuniary wants of the East India Company, miscalled the "Tribute of India," come to the relief of commerce and the money market.

Fortunately these wants relieved, to some extent, the annual purchasers of the products of India from a dilemma, and Indian productive industry from a check. The East India Company's Treasury was open for the receipt of cash, which was repayable to the depositors from the treasuries in India, and thus commercial transactions were not only facilitated, but the grower's industry was stimulated and profitably rewarded in India. During those eight years the East India Company received into their treasury in London the sum of 14,076,324*l.*, for which bills were granted upon the treasuries of the three presidencies. It is to be presumed the money was paid in London to be received in India by those who had balances of account against them for goods bought or to make new purchases. They had already sent 15 millions of treasure direct, and needed to send 29 millions more, a drain which the European money market could ill

bear. The India Company aided the merchants to the extent of 14 millions, but there was still a balance of trade in favour of India to the amount of 15,243,280*l.*, which neither imports of goods, imports of treasure, nor the bills of the Company, granted in England, had liquidated, and which must therefore have been arranged by private transactions.* The results of the above review of the commerce of India for eight years, establish the following facts: 1st. That the balance of trade was annually in favour of India, and was annually increasing; 2ndly. That India received part of this balance in bullion, averaging nearly two millions per annum, which was absorbed in India, and did not leave the country again; and 3rdly, that the annual pecuniary wants of the East India Company in England assisted merchants in discharge of their annual debt to India.

III.—*Period of Five Years*, 1849-50 *to* 1853-54.

It now remains to enquire whether the above are normal, or temporary and accidental conditions, and a fair test is to compare the preceding eight years trade with the trade of a more recent period. For that purpose I have taken the official returns for the five years, from 1849-50 to 1853-54 inclusive. The tables, as before, distinguish the trade of each presidency with every part of the world, and give the chief articles of export and import, and separate the export and import of treasure from goods.

The export of Produce from Bengal, independently of treasure, amounted, in the year 1849-50, to 10,148,038*l.*, in 1853-54, to 10,133,303*l.*; from Madras, the exports rose from 1,272,884*l.* to 1,963,020*l.*, in 1853-54, or 54 per cent.; and from Bombay, from 5,891,376*l.* to 7,198,816*l.*, or 22 per cent.

The Total Exports of produce from India to all parts of the world increased from 17,312,299*l.*, in 1848-49, to 19,295,140*l.*, in 1853-54, or 11·45 per cent., and the aggregate total amount of exports of merchandize during those five years was 95,115,476*l.*

The Imports into Bengal, exclusive of Treasure, rose from 5,283,170*l.* in 1849-50, to 5,673,366*l.* in 1853-54, or 7·38 per cent., showing a very small increased demand for foreign products. The imports did rise, in 1851-52, to more than seven millions, yet the very next year they fell to five millions, and since the year 1845, the previously rapid annual increase of the import trade into Bengal had ceased, with exceptional years, although the export trade had increased nearly three-quarters of a million.

The imports into Madras in 1849-50, were 906,004*l.*, in 1853-54, they had slightly risen to 956,377*l.*, or 5·55 per cent.

In Bombay the imports were 4,110,713*l.*, and they rose to 4,492,914*l.*, or 9·29 per cent.

* In these eight years the treasuries of India advanced upon goods hypothecated the sum of 6,783,895*l.*; and the Company's agent in China advanced upon hypothecated silks and tea the sum of 3,129,708*l.*, but this ceased in 1838-9. Small amounts were also annually remitted through Her Majesty's Government between 1841 and 1844; and the Royal Government repaid in England 2,178,406*l.*, disbursed by the East India Company for the China expedition, of which 573,442*l.* was paid in 1840-41 and 1841-42, two of the eight years under review. It is hence seen, with all these aids, the balance in favour of India of 15 millions left still a margin of nearly 3 millions not liquidated.

The total amount of the Import Goods Trade into India, in 1849-50, was 10,299,888*l.*, and in 1853-54, it was 11,122,658*l.*, an increase of 7·98 per cent.; but as it had risen to 12¼ millions in 1851-52; an annual *average* would show that the import trade had been nearly stationery. The aggregate total value of the imports in these five years was 55,292,688*l.*, leaving a balance of trade in merchandize in favour of India of 39,822,788*l.*, being a much larger annual balance in favour of India than during the eight years of the preceding period.

This was partly liquidated by imports of treasure, chiefly silver. The NET import into the three presidencies in 1849-50, was 2,425,565*l.*, in 1850-51, 3,270,519*l.*, in 1851-52, 4,132,970*l.*, in 1852-53,—5,776,149*l.*, and in 1853-54 it was 3,388,662*l.*, and the total amount of Bullion in these five years was 18,993,865*l.*, leaving a balance of trade in favour of India still unpaid of 20,828,923*l.*

In the *eight* years of the period already noticed, India absorbed 15,184,720*l.* of the precious metals, while in the *five* years, from 1849-50, India absorbed the increased amount of 18,993,865*l.*

The Company's annual pecuniary wants again appear as relieving the export trade from England, in part, from the increasing pressure for the export of bullion to India.

In the five years under review, from 1849-50 to 1853-54 inclusive, Bills were drawn upon Bengal for 13,973,317*l.*; upon Mdaras for 1,984,067*l.*; and upon Bombay for 159,400*l.*, making a total of 16,116,784*l.*; but the very large bullion remittances, and the great aid from the Company, still left the India trade a creditor with the rest of the world for 4,712,139*l.*, which must have been adjusted by private arrangements.*

Within the five years under review, a new element has brought its influence into operation, on the commercial relations between India and England, namely, the transference from England to India of the capital subscribed *in England* for the Indian railways.

This operation commenced in 1848-49, by the payment respectively of 30,000*l.* and 60,000*l.*, by the Great Indian Peninsular and East Indian Railways, and is in progress of being executed through the medium of the East India Company. The several Indian Railway Companies pay their subscriptions into the Company's treasury in London, part of these sums is re-issued to them in England for the purchase of railway stock, engines, rails, &c., the value of which necessarily increases the annual export trade of the country; the railway companies also need means for the expenses of their home office establishments, the cost of sending their servants to India, &c. In India for the prosecution of the surveys, earth works, management, &c., the railway companies are permitted to draw against their funds in the Company's treasury in England, upon the treasuries in India. These railway companies, therefore, although their capital is chiefly to be expended on labour in India, still stimulate certain branches of manufacturing industry in England, and largely aid the working classes in India; moreover, they hold out strong inducements to a large body of natives to qualify themselves mentally

* In 1849-50 and 1850-51 the payment was partly aided by advances made from the Company's treasuries in India to the amount of 1,663,429*l.* on goods hypothecated, but in 1850-51 hypothecation entirely ceased.

for very desirable employment as railway officials. The total amount paid by the railway companies into the Company's treasury in London, on account of subscribed capital, has been, from 1848-49 to 1853-54 inclusive, 2,161,958*l.* Simultaneously with the payment of these railway subscriptions there has been, as the tables show, an annual increasing export of bullion from England. The export trade of India has been gradually increasing for the last twenty years, and so had the import trade to the year 1849-50, since which year, however, although there has been a small increase, yet compared with former years, the imports may be almost considered stationary. The Company's annual pecuniary wants in England fluctuate very little: they require to draw bills upon India, therefore, to an amount within an appreciable limit. Beyond this limit they cannot aid merchants in adjusting trade balances between England and India; and as the payment by railway companies into the Company's treasury in London, curtails the facilities for the general trade for making remittances to India, through the Company, an increased export of bullion to India by private merchants, as is seen in the bullion exports, has necessarily taken place to adjust their accounts with India;* and this state of things must continue, while payments in cash are made into the Company's treasury in London, on account of Indian railway capital.

Previously to a consideration of the results of the comparison of the commerce of India from 1834-35 to 1841-42, with the period from 1849-50 to 1853-54, it may be useful to particularize the chief commodities of the trade of India with all countries for the first period. The staple exports from Bengal were cotton, indigo, opium, silk piece goods, sugar, oil—seeds, saltpetre, raw silk, grain. The great consumer of all these articles is the United Kingdom, excepting for cotton and opium, in which articles China precedes all other countries. China takes also a good deal of saltpetre. France follows the United Kingdom in indigo, but America precedes France in the consumption of silk goods, saltpetre, and sundries, but falls short in indigo. The Arabian and Persian Gulfs follow Great Britain in the import of sugar, and stand next below America in taking silk piece goods, and do not take saltpetre; but the Arabian and Persian Gulfs, and the Mauritius, precede all other countries in the import of grain. Penang and the Eastern Islands follow China in the consumption of opium. For the total value of the imports from Bengal the countries stand in the following order: United Kingdom, China, Eastern Islands, France, America; in some years, though rarely, France and America precede the Eastern Islands. From Madras the chief exports were cotton, grain, indigo, cotton piece goods, and some pepper, —no opium. The cotton piece goods went chiefly to the United Kingdom, Ceylon, and the Malacca Straits, and the Gulf of Persia. In the total value of imports from Madras, Ceylon follows the United Kingdom, then the Malacca Straits, China, and Arabia; America appeared to import little from Madras; France took indigo, and but little else. The chief exports from Bombay, were cotton, coffee, ivory, shawls, and piece goods, sugar, pepper, raw silk, opium,

* The export of gold and silver to the East from England in the year 1855 amounted to 6,409,889*l.*, and from the Mediterranean ports 1,767,479*l.*—Total, 8,177,368*l.*

and sundries. The maximum value in all these articles went to the United Kingdom, excepting opium, shawls, and piece goods, and sugar. The shawls and piece goods went almost entirely to the Persian and Arabian Gulfs; the opium entirely to China and the Eastern Islands; and the sugar went to the Arabian and Persian Gulfs. In consequence of the opium trade and the quantity of cotton taken by China, she preceded the United Kingdom in the total value of imports from Bombay; and Cutch and the Persian and Arabian Gulfs precede European nations. In 1840-41 and 1841-42, China and the United Kingdom approach each other in the total value of their imports from Bombay. In the period from 1849-50 to 1853-54, in addition to the above noticed chief articles exported from India, there was a considerable increase in oil seeds, cocoa-nut oil, lac dye, and shell lac. English manufacturers and merchants, are probably unaware that their interests are mixed up with this opium trade between India and China—Goods and Treasure are sent to India to buy indigo, sugar, opium, cotton, &c. The opium and cotton are sent to China; where tea and silks are purchased;—sent to England,—sold, and with the money, manufactures and bullion are sent out to India, or money is paid into the Company's Treasury for bills on India, and more indigo, sugar, opium, and cotton are bought. The opium being sent to China for tea and silk, which are sold in England, and more manufactures or bullion are sent out to India; and the round of trade through China is thus continued in endless succession, opium being one of the chief articles of the trade.

The course of trade in the last five years has remained much as before, but in the last years the order of export from Madras, was Ceylon, Mauritius, Arabian and Persian Gulfs, France, China, and Penang, and recently there has been considerable export of sugar from Madras.

The exports from the United Kingdom to India consist chiefly of cotton fabrics, cotton twist and thread, woollens, metals, hardware, glass ware, spirits, wine, and malt liquors, stationery, and latterly, railway machines and materials.

IV.—*Statement of Results.*

It now only remains to make a summary of the results of the comparisons of the periods from 1834-35 to 1841-42, with the period from 1849-50 to 1853-54, and the facts and figures establish without doubt the following normal condition of the commerce of India:—

1st. For the last twenty years the balance of trade has annually increased in favour of India.

2ndly. Merchants and manufacturers trading with India, beyond their manufactures, have been compelled to transmit to India large and increasing amounts of bullion, in part liquidation of the balance of trade, which bullion has been absorbed by India, and has not again left the country.

3rdly. That the annual pecuniary wants of the East India Company, "miscalled the tribute of India," has very materially facilitated mercantile operations in discharge of Indian claims.

4thly. That hypothecation in India upon goods, while it lasted, also facilitated mercantile operations.

5thly. That the combined aids of exports to India, in manufac-

tures, treasure, Company's bills on India, and hypothecation in India on goods, were insufficient to liquidate in full, the trade debt to India, and a margin remained for adjustment by other means.

This state of the external commerce of India suggests the reflections, that the industry of India is so active, and its products so much in demand, and its foreign wants comparatively so limited, that a large portion of its products must be paid for in bullion; that manufacturing countries cannot bear a perennial drain of this kind without embarrassment to their monetary systems; and that, as the Indian Custom House returns afford satisfactory proof that within the present century, India has absorbed above one hundred millions of bullion, which have never again gone out of the country, India is, in fact, at the present day as Pliny designated it 1800 years ago, "the sink of the precious metals." It is of grave importance, therefore, to merchants trading with India, that they should have a clear and comprehensive view of those normal conditions which indicate that their export trade in goods, seems to have attained its maximum, while their import of Indian commodities has been annually increasing; and not less important is it, that the bullionists and bankers of England, and of other countries, should be constantly and fully alive to the exhaustive process of an Indian trade.

TABLE I.

Abstract of the following Table II.

Years ended 30th April.	Total Amount of Goods Imported into the three Presidencies.	Total Amount of Goods Exported from the three Presidencies.	Excess of Goods Exported.	Net Import of Bullion.	Excess of Exports of Goods, deducting Net Imports of Bullion.	Stores Imported from England for the Service of the Governments of India not included in the Reports of External and Internal Commerce.	Net Excess of Exports, deducting Imports of Bullion and Stores for the Government.
	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £
1834–35	5,883	9,674	3,791	1,771	2,020	200	1,820
1835–36	6,526	12,747	6,221	2,073	4,147	171	3,976
1836–37	7,531	15,119	7,587	1,772	5,815	238	5,576
1837–38	6,729	12,849	6,120	2,299	3,821	258	3,563
1838–39	6,906	13,480	6,574	2,663	3,911	303	3,607
1839–40	7,430	12,643	5,212	1,474	3,737	338	3,399
1840–41	10,446	15,516	5,070	1,414	3,655	456	3,198
1841–42	9,757	16,020	6,263	1,715	4,547	370	4,177
Totals	61,211	108,052	46,841	15,184	31,656	2,336	29,319
Average of eight years....	7,651	13,506	5,855	1,898	3,957	292	3,664

The above statement includes the Goods consigned between the ports in India.

Note.—For the sake of space and clearness the last three figures of each sum are cut off, thus, 5,883 is really 5,883,000*l.* and this remark applies generally to all the tables.

TABLE II.

Statement of the Value, in Sterling, of Goods, Merchandize, and Bullion, IMPORTED *into, and* EXPORTED *from, the Three Presidencies of India* 1834-35 *to* 1841-42.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.
Years ended 30th April.	BENGAL.					MADRAS.							BOMBAY.						Total of the Three Presidencies.		
	Imports.			Exports.	Excess of Exports.	Imports.			Exports.	Net Export of Bullion.	Total Exports.	Excess of Exports.	Imports.			Exports.	Excess of Imports.	Excess of Exports.			
	Imports, (exclusive of Bullion.)	Net Imports of Bullion.	Total Imports, Goods Bullion.			Imports, (exclusive of Bullion.)	Net Imports of Bullion.	Total Imports.					Imports, (exclusive of Bullion.)	Net Imports of Bullion.	Total Imports.				Total Imports.	Total Exports.	Excess of Exports.
	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £
1834–35	2,192	579	2,772	4,519	1,747	977	46	1,023	1,669	..	1,669	645	2,713	1,144	3,858	3,485	372	..	7,654	9,674	2,020
1835–36	2,460	630	3,091	5,887	2,796	896	81	977	1,914	..	1,914	936	3,168	1,361	4,530	4,944	..	414	8,599	12,747	4,147
1836–37	3,098	451	3,549	7,123	3,573	1,056	3	1,059	2,210	..	2,210	1,151	3,376	1,317	4,694	5,784	..	1,090	9,303	15,119	5,815
1837–38	2,725	908	3,634	7,154	3,519	1,004	22	1,026	1,631	..	1,631	605	2,999	1,368	4,368	4,064	303	..	9,028	12,849	3,821
1838–39	2,790	1,056	3,847	7,158	3,311	1,034	39	1,074	1,897	..	1,897	822	3,080	1,566	4,647	4,424	222	..	9,569	13,480	3,911
1839–40	3,625	1,026	4,652	7,125	2,473	1,047	..	1,047	1,998	15	2,013	965	2,742	463	3,205	3,519	..	314	8,905	12,643	3,737
1840–41	4,984	772	5,757	8,362	2,605	1,137	..	1,137	1,988	21	2,009	871	4,302	663	4,966	5,165	..	199	11,861	15,516	3,655
1841–42	4,677	1,178	5,855	8,440	2,585	1,052	..	1,052	2,256	112	3,368	1,316	3,914	650	4,564	5,323	..	759	11,473	16,020	4,547

The three figures at *unit* end are omitted.

TABLE III.

Total Value in Sterling of Principal Articles of Produce EXPORTED *from the Whole of British India to Great Britain and other Foreign Parts during the Five Years (ended 30th April)* 1849-50 *to* 1853-54.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
Principal Articles.	1849-50.		1850-51.		1851-52.		1852-53.		1853-54.	
	Quantity.	Value in Sterling.	*Quantity.*	Value in Sterling.	*Quantity.*	Value in Sterling.	*Quantity.*	Value in Sterling.	*Quantity.*	Value in Sterling.
		Mlns. £		Mlns. £		Mlns. £		Mlns. £		Mlns. £
Sugar ..... cwt.	1,624	1,925	1,591	1,823	1,607	1,801	1,477	1,729	1,085	938
Indigo ..... lbs.	10,182	1,838	11,134	1,980	11,415	2,025	10,412	1,809	11,561	2,067
Cotton, raw..... ..... lbs.	165,665	2,201	226,473	3,474	253,552	3,619	262,908	3,629	197,761	2,802
Do. Piece Goods .... Pieces	3,575	742	3,366	637	4,214	748	4,826	889	3,761	769
Opium ..... Chests	51	5,973	52	5,459	60	6,515	61	7,034	67	6,437
Saltpetre ..... cwt.	534	403	486	375	550	431	583	448	701	528
Silk, raw ..... lbs.	1,435	666	1,425	619	1,469	688	1,401	667	1,693	640
Do. Piece Goods ..... Pieces	819	441	634	355	479	260	593	315	591	314
Miscellaneous	....	3,120	....	3,437	....	3,788	....	3,941	....	4,797
Exports (Merchandise)	....	17,312	....	18,164	....	19,879	....	20,464	....	19,295
Treasure	....	971	....	541	....	919	....	1,055	....	1,483
Total Exports	....	18,283	....	18,705	....	20,798	....	21,519	....	20,778

Note.—The three figures at the unit end of the several columns are omitted for the sake of greater clearness, and in order to economise space. Thus, in the first line, 1,624 represents 1,624,000 cwt., and 1,925 represents £1,925,000; and under the head of Treasure, 971 means £971,000. In short, three 000 are to be added to every sum.

TABLE IV.

Statement showing Total Value, in Sterling, of Principal Articles of Domestic and Foreign Produce EXPORTED *from Each Presidency to Great Britain and all other places from the year* 1849-50 *to* 1853-54 *inclusive.*

BENGAL.

Articles.	1849-50.		1850-51.		1851-52.		1852-53.		1853-54.	
	Domestic Produce or Exports.	Foreign Produce or Imports Re-exported.	Domestic Produce or Exports.	Foreign Produce or Imports Re-exported.	Domestic Produce or Exports.	Foreign Produce or Imports Re-exported.	Domestic Produce or Exports.	Foreign Produce or Imports Re-exported.	Domestic Produce or Exports.	Foreign Produce or Imports Re-exported.
	Value.	Value.	Value.	Value.	Value.	Value.	Value.	Value.	Value.	Value.
	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £
Sugar	1,663	....	1,521	....	1,451	....	1,420	....	535	....
Indigo	1,674	....	1,716	....	1,819	....	1,388	....	1,701	2
Cotton, raw	22	....	281	....	495	....	407	....	169	....
,, Piece Goods	27	72	38	75	22	95	29	94	34	6
Opium	3,591	....	3,155	....	3,137	....	4,020	....	3,688	....
Saltpetre	393	....	361	....	409	....	431	....	501	....
Silk, raw	634	....	605	....	681	....	659	....	604	....
,, Piece Goods	417	....	329	3	238	1	285	1	301	....
Treasure	354	....	276	....	250	....	476	....	437	....
Miscellaneous	1,479	170	1,765	144	1,945	125	1,822	177	2,456	129
Total Exports	10,259	....	10,050	....	10,452	....	10,940	....	10,431	....
,, Imports re-exported	....	242	....	223	....	222	....	274	....	139
Total Exports and Re-exports	£10,502,245		£10,273,856		£10,674,556		£11,214,929		£10,571,216	

The three figures at *unit* end are omitted.

TABLE IV.—*Continued.*

Statement showing Total Value, in Sterling, of Principal Articles of Domestic and Foreign Produce EXPORTED *from Each Presidency to Great Britain and all other places from the year* 1849-50 *to* 1853-54 *inclusive.*

MADRAS.

Articles.	1849-50.		1850-51.		1851-52.		1852-53.		1853-54.	
	Domestic Produce or Exports.	Foreign Produce or Imports Re-exported.	Domestic Produce or Exports.	Foreign Produce or Imports Re-exported.	Domestic Produce or Exports.	Foreign Produce or Imports Re-exported.	Domestic Produce or Exports.	Foreign Produce or Imports Re-exported.	Domestic Produce or Exports.	Foreign Produce or Imports Re-exported.
	Value.	Value.	Value.	Value.	Value.	Value.	Value.	Value.	Value.	Value.
	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £
Sugar	143	....	202	....	271	....	240	....	311	....
Indigo	156	....	250	....	185	....	377	....	316	....
Cotton, raw	160	....	250	....	219	1	382	2	162	....
,, Piece Goods	170	2	171	3	204	1	259	2	206	3
Opium	....	....	....	....	....	....	....	....	....	....
Saltpetre	8	....	11	....	16	....	11	....	15	....
Silk, raw	....	....	....	....	....	....	....	....	1	....
,, Piece Goods	....	....	1	....	....	....	....	....	....	....
Treasure	72	....	104	....	215	....	36	....	115	....
Miscellaneous	590	38	647	27	727	29	816	28	913	30
Total Exports	1,304	....	1,640	....	1,842	....	2,124	....	2,044	....
,, Imports re-exported	....	41	....	30	....	32	....	33	....	34
Total Exports and Re-exports	£1,345,522		£1,671,117		£1,874,576		£2,157,995		£2,078,676	

The 000's at the *unit* end are omitted—thus, 8 is £8,000.

TABLE IV.—*Continued.*

Statement showing Total Value, in Sterling, of Principal Articles of Domestic and Foreign Produce EXPORTED *from Each Presidency to Great Britain and all other places from the year* 1849-50 *to* 1853-54 *inclusive.*

BOMBAY.*

Articles.	1849-50.		1850-51.		1851-52.		1852-53.		1853-54.	
	Domestic Produce or Exports.	Foreign Produce or Imports Re-exported.	Domestic Produce or Exports.	Foreign Produce or Imports Re-exported.	Domestic Produce or Exports.	Foreign Produce or Imports Re-exported.	Domestic Produce or Exports.	Foreign Produce or Imports Re-exported.	Domestic Produce or Exports.	Foreign Produce or Imports Re-exported.
	Value.	Value.	Value.	Value.	Value.	Value.	Value.	Value.	Value.	Value.
	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £
Sugar	....	117	....	99	....	77	....	68	....	91
Indigo	....	7	....	13	....	20	....	43	....	46
Cotton, raw	1,548	469	1,901	1,041	2,105	797	1,769	1,068	1,765	703
,, Piece Goods	68	400	28	320	12	412	28	474	30	488
Opium	....	2,381	....	2,304	....	3,377	....	3,013	2,748	....
Saltpetre	....	....	....	2	....	5	....	6	5	6
Silk, raw	....	31	....	13	....	7	....	7	....	33
,, Piece Goods	16	6	12	8	15	4	21	5	6	5
Treasure	215	329	20	140	301	151	124	418	236	692
Miscellaneous	174	667	145	707	135	824	309	786	610	656
Total Exports	2,023	....	2,108	....	2,569	....	2,253	....	5,404	....
,, Imports re-exported	....	4,412	....	4,651	....	5,679	....	5,893	....	2,723
Total Exports and Re-exports	£6,435,775		£6,760,464		£8,249,207		£8,146,938		£8,128,543	

* It is necessary to point out, in regard to Bombay, that the return of the Produce re-exported from that Presidency includes not only that previously imported from countries properly foreign, but also the produce received from the other Presidencies of British India, and subsequently re-exported to Great Britain and elsewhere. The 000's at unit end omitted—thus, 7 is £7,000.

Table V.

Statement showing the Total Value, in Sterling, of the Principal Articles Imported *into British India from Great Britain and other places for the Years* 1849-50, 1850-51, 1851-52, 1852-53, *and* 1853-54.

Articles.	1849-50.			1850-51.			1851-52.			1852-53.			1853-54.		
	Great Britain.	Other Places.	Total.	Great Britain.	Other Places.	Total.	Great Britain.	Other Places.	Total.	Great Britain.	Other Places.	Total.	Great Britain.	Other Places.	Total.
	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £
Apparel	271	20	292	261	32	294	250	28	279	256	29	286	269	35	305
Books, Stationery, &c.	102	29	132	148	35	183	118	30	148	113	22	136	144	34	179
Cotton Twist and Yarn	1,106	10	1,116	1,011	28	1,039	1,373	17	1,391	1,102	28	1,130	1,271	35	1,306
,, Piece Goods	3,315	53	3,369	3,581	60	3,642	4,662	108	4,770	3,578	89	3,667	4,324	107	4,432
Fruits	1	144	146	....	139	140	....	148	149	...	134	134	....	225	225
Jewellery	35	11	46	52	29	81	56	23	80	28	14	42	59	41	101
Malt Liquors	100	....	100	123	1	125	146	....	147	151	1	153	161	....	162
Machinery	7	....	8	19	1	20	11	2	14	23	3	26	51	1	52
Metals manufactured	146	31	178	201	44	245	230	16	246	182	34	217	250	36	286
Copper	500	159	659	611	267	878	216	225	441	114	95	210	109	167	276
Iron	308	2	310	457	7	464	267	28	295	140	5	145	94	8	103
Lead	48	2	51	58	3	61	27	....	27	17	4	22	9	2	11
Spelter	99	5	105	62	16	78	55	4	60	8	2	11	8	....	9
Tin	6	41	47	8	60	68	6	64	71	1	76	77	15	30	46
Salt	218	242	461	376	289	666	552	281	833	399	272	671	35	76	112
Silken Goods	10	97	107	18	92	111	31	94	126	38	71	110	24	92	116
Spices	....	94	94	....	69	69	....	80	80	....	127	127	....	95	95
Spirits	48	90	139	42	116	159	49	70	119	33	62	96	42	72	114
Tea	....	33	33	....	68	68	....	139	139	....	79	79	...	56	56
Tobacco, Cigars, &c.	....	50	51	....	43	43	....	39	40	....	51	51	....	37	38
Timber	....	52	53	1	44	45	1	67	68	1	53	55	29	19	48
Woollen Goods	150	4	155	206	11	218	200	5	205	114	27	142	139	3	143
Wines	182	29	211	232	41	273	200	42	242	144	36	181	176	39	215
Miscellaneous	915	1,510	2,426	849	1,725	2,575	764	1,493	2,258	781	1,512	2,294	1,192	1,487	2,680
Total Merchandize	7,578	2,720	10,299	8,327	3,230	11,558	9,226	3,013	12,240	7,235	2,835	10,070	8,411	2,711	11,122
,, Treasure	26	3,370	3,396	503	3,308	3,811	1,041	4,011	5,052	2,340	4,490	6,831	1,645	3,226	4,871
Grand Total Merchandize and Treasure	7,605	6,091	13,696	8,831	6,539	15,370	10,267	7,024	17,292	9,576	7,326	16,902	10,057	5,937	15,994

Table VI.

Statement showing the Imports and Exports of Treasure *in each of the Presidencies in India from* 1834-35 *to* 1841-42.

Years ended 30th April.	Bengal.				Madras.				Bombay.				Bengal, Madras, and Bombay.			
	Imports.	Exports.	Net Imports.	Net Exports.	Imports.	Exports.	Net Imports.	Net Exports.	Imports.	Exports.	Net Imports.	Net Exports.	Imports.	Exports.	Net Imports.	Net Exports.
	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £
1834–35	646	66	579	....	153	106	46	....	1,177	32	1,144	....	1,976	205	1,771	Nil.
1835–36	687	56	630	....	112	31	81	....	1,401	40	1,361	....	2,201	128	2,073	....
1836–37	612	161	451	....	75	72	3	....	1,347	30	1,317	.....	2,036	263	1,772	....
1837–38	1,048	140	908	....	128	106	22	....	1,462	93	1,368	....	2,640	340	2,299	....
1838–39	1,219	162	1,056	....	131	91	39	....	1,660	93	1,566	....	3,010	347	2,663	....
1839–40	1,226	200	1,026	....	112	127	....	15	606	143	463	....	1,945	470	1,474	....
1840–41	918	146	772	....	68	89	....	21	850	187	663	....	1,837	422	1,414	....
1841–42	1,337	159	1,178	....	67	180	....	112	841	191	650	....	2,246	531	1,715	....
Total.....	7,693	1,090			,846	,802			9,344	,809			17,891	2,706	15,184	

Mem.—Consignments of Treasure between the several Ports and Presidencies of India are excluded from the above Statement.

TABL

Imports into and Exports from the whole of India, (Bengal, Madras, and Bomba
Trade

Years ended 30th April.	Presidency.	United Kingdom.				Foreign Europe.				America.			
		Imports.		Exports.		Imports.		Exports.		Imports.		Exports.	
		Gold.	Silver.	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.	Gold.	Silve
		£	£	£	£	£	£	£	£	£	£	£	£
1846–47.....	Bengal	...	...	...	...	1	...	...	...	15	7	...	...
	Madras	...	...	...	...	...	...	...	...	...	...	...	...
	Bombay.....	...	1	...	...	...	...	...	...	...	...	...	...
		...	1	...	...	1	...	...	...	15	7	...	...
1847–48.....	Bengal	19	33	...	610	...	1	...	...	18	16	...	...
	Madras	4	1	2	74	...	...	...	...	1	4	...	5
	Bombay.....	...	...	...	19	...	...	...	...	...	...	...	...
		23	35	2	703	...	1	...	...	19	21	...	5
1848–49.....	Bengal	15	21	37	574	...	...	...	...	6	11	...	...
	Madras	...	...	1	649	...	...	...	...	...	...	...	...
	Bombay.....	...	...	...	236	...	...	...	...	...	...	...	2
		15	21	38	1,460	...	...	...	...	6	11	...	2
1849–50.....	Bengal	9	16	36	34	...	...	...	...	...	6	...	...
	Madras	...	...	...	5	...	...	...	...	...	...	...	...
	Bombay.....	...	...	...	42	...	...	...	6	...	...	...	...
		10	16	36	82	...	...	...	6	...	6	...	...
1850–51.....	Bengal	14	356	...	...	...	16	...	...	...	3	...	....
	Madras	4	98	...	10	...	2	...	...	...	...	...	...
	Bombay.....	3	24	...	...	...	...	...	...	...	...	...	...
		22	480	...	10	...	18	...	...	...	3	...	...
1851–52.....	Bengal	45	870	...	6	...	47	...	...	...	13	...	...
	Madras	26	70	...	...	...	11	...	...	...	...	...	...
	Bombay.....	...	28	...	...	...	...	...	...	...	...	...	...
		71	969	...	6	...	58	...	...	...	13	...	...
1852–53.....	Bengal	117	1,569	128	...	59	...	...	...	...	1	...	...
	Madras	11	353	...	...	...	17	...	...	...	...	...	...
	Bombay.....	1	287	...	...	...	3	...	...	...	...	...	...
		130	2,210	128	...	59	21	...	...	...	1	...	...
1853–54.....	Bengal	6	890	...	7	...	147	...	...	...	...	...	...
	Madras	17	367	...	...	...	3	...	...	...	...	...	...
	Bombay.....	28	335	...	...	...	4	...	2	...	...	...	...
		52	1,593	...	7	...	156	...	2	...	...	...	...
	Total, 8 years	326	5,327	207	2,270	61	257	...	9	42	65	...	9

The three figures at the unit end of each number are omitted. In some cases the Imports and Exports we
and Exports of £1,

VII.

f GOLD *and* SILVER, *distinguishing the Countries and Regions with which the aken place.*

China.				All other places.				Total.			Total.			Net Imports of Treasure
Imports.		Exports.		Imports.		Exports.		Imports.			Exports.			
Gold.	Silver.	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.	Total Gold and Silver.	Gold.	Silver.	Total Gold and Silver.	
£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
53	751	...	...	144	361	...	285	215	1,120	1,336	...	285	285	
...	...	...	...	27	119	...	67	27	119	147	...	68	68	
405	699	...	...	202	147	2	357	608	847	1,456	2	357	360	
459	1,450	...	...	374	628	2	709	851	2,088	2,939	2	710	713	2,226
95	203	...	32	228	128	...	262	362	384	747	...	905	905	
5	...	...	...	39	75	...	131	51	80	132	2	211	214	
414	316	...	...	220	142	6	280	634	459	1,094	6	299	306	
515	520	...	32	489	346	6	674	1,048	924	1,973	9	1,416	1,426	5,473
252	637	...	...	182	287	3	166	457	957	1,414	41	741	782	
1	...	...	...	33	82	...	82	34	82	117	1	732	733	
680	1,536	...	...	230	225	10	773	910	1,762	2,672	10	1,012	1,023	
934	2,174	...	...	445	595	14	1,023	1,401	2,802	4,204	52	2,486	2,539	1,664
176	621	...	60	151	231	26	196	338	876	1,214	63	291	354	
2	...	...	...	53	64	1	66	56	64	121	1	71	72	
455	1,070	...	...	310	223	...	494	765	1,294	2,060	...	543	544	
634	1,692	...	60	514	520	28	757	1,160	2,236	3,396	64	906	971	2,425
153	288	...	...	151	205	...	275	318	870	1,189	...	275	276	
...	...	...	...	28	125	...	93	33	226	260	...	103	104	
541	861	...	1	257	672	...	158	802	1,559	2,362	...	160	160	
695	1,150	...	1	437	1,003	...	527	1,155	2,656	3,811	2	539	541	3,270
233	654	...	...	192	249	69	174	471	1,835	2,306	70	180	250	
...	...	...	...	49	139	...	215	76	220	297	...	215	215	
460	953	...	3	330	675	...	448	790	1,657	2,448	...	452	452	
693	1,608	...	3	573	1,064	70	837	1,338	3,713	5,052	70	847	919	4,132
235	954	4	...	308	148	12	330	720	2,673	3,393	145	330	476	
...	...	...	...	38	156	...	36	49	527	576	...	36	36	
333	908	5	20	230	1,095	17	498	564	2,295	2,860	23	519	542	
568	1,862	9	21	576	1,400	30	864	1,335	5,496	6,831	168	886	1,055	5,776
91	57	1	258	388	503	2	167	486	1,599	2,085	4	433	437	
...	...	...	...	69	119	...	115	87	490	577	...	115	115	
166	336	10	449	333	1,004	2	465	528	1,680	2,208	12	917	929	
257	393	12	707	790	1,627	5	748	1,101	3,770	4,871	17	1,466	1,483	3.388
4,759	10,851	22	826	4,202	7,186	159	6,144	9,393	23,688	33,081	389	9,260	9,649	23,432

few hundreds merely: and it will be readily understood that while these do not appear in the table, all Imports or above do appear.

TABLE VIII.

Assay Produce of SILVER BULLION *received into the Mints of Calcutta, Madras, and Bombay, in each Year from* 1835-36 *to* 1853-54, *and of the Value of the* SILVER COINAGES *for the same period.*

Years ended 30th April.	CALCUTTA MINT.			MADRAS MINT.			BOMBAY MINT.		
	Assay Produce of Silver received from Individuals.	Value of Uncurrent Coins received from Treasury Officers.	Silver Coinage.	Assay Produce of Silver received from Individuals.	Value of Uncurrent Coins received from Treasury Officers.	Silver Coinage.	Assay Produce of Silver received from Individuals.	Value of Uncurrent Coins received from Treasury Officers.	Silver Coinage.
	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £
1835–36	808	1,368	1,624				548	94	643
1836–37	665	2,014	2,981				593	233	827
1837–38	1,309	1,178	2,093	The ope	rations of	this	504	590	1,094
1838–39	1,412	997	2,676	Mint	were sus	pended	582	595	1,177
1839–40	1,255	902	2,157	from	1834 to	1841.	665	317	982
1840–41	1,047	565	1,641				616	586	1,203
1841–42	977	844	2,512	47	257	258	437	770	517
From China	646								
1842–43	1,768	197	2,061	911	80	164	395	209	1,079
1843–44	1,931	392	2,176	119	361	422	1,489	196	2,073
1844–45	1,866	926	2,833	39	203	317	1,656	81	1,546
1845–46	940	701	2,253	53	255	223	1,267	477	1,366
1846–47	956	683	1,647	20	523	608	564	199	664
From China	241								
1847–48	449	344	1,011	10	289	349	162	247	420
1848–49	921	525	1,330	17	121	129	Returns tain	not ob- able.	1,119
1849–50	1,031	341	1,359	23	94	86	882	132	965
1850–51	957	333	1,213	119	191	195	1,194	471	1,207
1851–52	1,976	195	1,788	151	135	362	1,607	627	2,089
1852–53	2,714	275	2,736	532	77	393	2,204	135	2,379
1853–54	1,436	306	2,318	492	68	675	1,353	428	2,260
	25,315	13,094		1,718	2,660		16,726	6,396	
	38,410		38,418	4,379		4,186	23,123		23,619

The 000's at *unit* end are omitted—thus, 47 is 47,000.

1835-36 *to* 1853-54.

Assay Produce of Silver received from Individuals.

	£	
Calcutta Mint	25,315,471	
Madras do.	1,718,898	
Bombay do.	16,726,560	
		43,760,930

Value of Uncurrent Coins received from Treasury Officers.

	£	
Calcutta Mint	13,094,873	
Madras do.	2,660,294	
Bombay do.	6,396,950	
		22,152,118
Total.....		£65,913,049

Silver Coinage.

	£	
Calcutta Mint	38,418,120	
Madras do.	4,186,708	
Bombay do.	23,619,343	
Total.....		£66,224,172

Note.—If the Bombay Returns for 1848-9 were available, the above two amounts would, no doubt, be reconciled. There is every reason to believe that this vast amount of 66¼ millions is gradually pervading the whole of India, superseding the native coinage, and supplying to the people the means of paying their land-tax in money instead of in kind, as is the case, to some extent, under native Governments, and even under our own, in recently acquired provinces.

TABLE IX.

Statement exhibiting the Highest and Lowest Rates at which Bills of Exchange have been drawn at Calcutta, upon England, in the following Years.

RATES FOR PRIVATE BILLS AS TAKEN FROM PRICES CURRENT.

	Highest Rate.	Lowest Rate.	Company's Advances against Consignments.
	s. *d.*	*s.* *d.*	*s.* *d.* *s.* *d.*
1834–35....	Co's. R. 2 0½	Co's. R. 1 10½	Co's. R. 1 11½ @ 2 0½
	Sicca R. 2 2	Sicca R. 2 0	Sicca R. 2 1 @ 2 2
1835–36....	Co's. R. 2 1½	Co's. R. 1 11½	Co's. R. 1 11½ @ 2 0½
	Sicca R. 2 3	Sicca R. 2 1	Sicca R. 2 1 @ 2 2
1836–37....	Co's. R. 2 3	Co's. R. 2 1	Co's. R. 2 0½ @ 2 1
1837–38....	,, 2 3	,, 1 11	,, 2 0 @ 2 2
1838–39....	,, 2 2¾	,, 2 1	,, 2 2
1839–40....	,, 2 2¼	,, 2 0	,, 2 1 @ 2 2
1840–41....	,, 2 1¾	,, 1 11¾	,, 2 0 @ 2 2
1841–42....	,, 2 2½	,, 1 11¾	,, 2 0 @ 2 2

There are no quotations in the Price Current of the Rates of Exchange between the several Presidencies of India and Foreign Countries and States.

TABLE X.

Bills drawn by the East India Company upon the several Presidencies of India during Two Periods of Years, viz., Eight Years, 1834-5 *to* 1841-2, *and Five Years,* 1849-50 *to* 1853-4.

	Bengal.	Madras.	Bombay.	Total.	Average Rate of Exchange at which the Company have drawn on India by Bills at 60 Days' Sight.
	Mlns. £	Mlns. £	Mlns. £	Mlns. £	d.
1834–35....	530	10	191	732	1834–35.... 22 ·782 per Co.'s R.
1835–36....	1,655	223	166	2,045	1835–36.... 22 ·593 ,,
1836–37....	1,781	167	93	2,042	1836–37.... 22 ·987 ,,
1837–38....	1,461	166	78	1,706	1837–38.... 23 ·070 ,,
* 1838–39....	2,199	123	23	2,346	1838–39.... 23 ·658 ,,
1839–40....	1,323	87	29	1,439	1839–40 ... 23 ·449 ,,
1840–41....	1,066	46	62	1,174	1840–41.... 23 ·507 ,,
1841–42....	2,345	106	137	2,589	1841–42.... 22 ·541 ,,
Total	12,364	931	780	14,076	1842–43.... 23 ·554 ,,
					1843–44.... 23 ·012 ,,
					1844–45.... 21 ·632 ,,
					1845–46.... 21 ·689 ,,
					1846–47.... 22 ·677 ,,
1849–50	2,503	399	32	2,935	1847–48.... 21 ·976 ,,
1850–51 *	2,874	325	36	3,236	1848–49.... 21 ·094 ,,
1851–52	2,364	389	23	2,777	1849–50.... 22 ·495 ,,
1852–53....	2,875	393	48	3,317	1850–51.... 24 ·286 ,,
1853–54....	3,355	476	18	3,850	1851–52.... 24 ·144 ,,
					1852–53.... 23 ·904 ,,
Total	13,973	1,984	159	16,116	1853–54.... 24 ·146 ,,
					1854–55.... 23 ·141 ,,

* Extracted from Parliamentary Accounts, dated 5th May, 1852.
The 000's at *unit* end are omitted—thus, 10 is £10,000.

TABLE XI.

Abstract of Imports and Exports of Goods and Bullion from 1849-50 *to* 1853-4.

Years ended 30th April.	Total Amount of Goods *imported* into the Three Presidencies.	Total Amount of Goods *exported* from the Three Presidencies.	Excess of Goods *Exported.*	Net Import of *Bullion.*	Excess of Exports of Goods, deducting Net Import of Bullion.	Bills drawn upon India by the Directors.	Final Balances of Trade in favour of India adjusted by other means.
	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £
1849–50	10,300	17,312	7,012	2,425	4,587	2,936	7,651
1850–51	11,559	18,164	6,605	3,270	3,335	3,236	99
1851–52	12,240	19,879	7,639	4,133	3,506	2,777	729
1852–53	10,071	20,465	10,394	5,776	4,618	3,317	1,301
1853–54	11,122	19,295	8,173	3,389	4,784	3,850	934
Total ...	55,292	95,115	39,823	18,993	20,830	16,116	4,713
Average..	11,058	19,023	7,965	3,799	4,166	3,223	943

The 000's at *unit* end are omitted—thus, 10,300 is £10,300,000.

Equitable Villages in America. By William Pare, Esq.

[Read before the Statistical Section of the British Association at Glasgow, September, 1855.]

There was founded, some four years since, in Long Island, in the State of New York, what is called an "*Equitable Village*," under the distinctive title of "*Modern Times*." Its origin is due to Mr. Josiah Warren, formerly of Cincinnati, Ohio, who claims to be the discoverer of a new theory of society, now sought to be reduced to practice at "*Modern Times*," and other "*Equitable Villages*" in various parts of the United States of North America.

As this new theory of society is different to any heretofore attempted, and is now being tested by actual experiment, I trust I may be excused for occupying a few minutes of your time in stating what are its main features, and in directing your attention to a few simple works, from which those who desire may obtain further information, and from which I shall freely quote materials for this paper.

Mr. Warren gives to his theory the generic title of "*Equitable Commerce*," using the word "commerce" not in its restricted and ordinarily understood sense, as pertaining only to trade, and the interchange of commodities, but in the enlarged *old* English signification of the word "conversation," that is, human intercourse of all sorts, interchange of work, business, ideas, civilities, or amusements; in short, the concrete, or *tout ensemble*, of human relations.

According to Mr. Warren, the following is the Social Problem, in all its branches, which has to be solved:—

I. The proper, legitimate, and just reward of labour.

II. Security of person and property.

III. The greatest practicable amount of freedom to each individual.

IV. Economy in the production and uses of wealth.

V. To open the way for each individual to the possession of land, and all other natural wealth.

VI. To make the interests of all to co-operate with and assist each other, instead of clashing with and counteracting each other.

VII. To withdraw the elements of discord, of war, of distrust, and repulsion; and to establish a prevailing spirit of peace, order, and social sympathy.

And, according to him also, the following principles are the means of the solution of this Social Problem:—

1. Individuality.
2. The Sovereignty of every individual.
3. Cost as the limit of price.
4. A circulating medium founded on the cost of labour.
5. Adaptation of the supply to the demand.

As observed by Mr. Stephen Pearl Andrews, an acute writer on the subject, "the mere reading of this programme will suggest the immensity of the scope to which the subject extends. A few minds may, from these principles, begin to perceive the rounded outlines of what Mr. Andrews does not hesitate to pronounce the most complete

scientific statement of the problem of human society which has ever been presented to the world. Most, however, will hardly begin to understand the universal and all-pervading potency of these few simple principles, until they find them elaborately displayed and elucidated." The briefest possible exposition, however, of each of these principles is all that will be expected of me on this occasion.

And first of "Individuality," out of which springs the doctrine of the "Sovereignty of the Individual."

It is affirmed, that individuality pervades universal nature; that it is positively the most fundamental and universal principle which the finite mind seems capable of discovering, and the best image of the infinite. There are no two objects in the universe which are precisely alike. Each has its own constitution and peculiarities which distinguish it from every other. Infinite diversity is the universal law. In the multitude of human countenances, for example, there are no two alike; and in the multitude of human characters there is the same variety. The principle applies equally to persons, to things, and to events. There have been no two occurrences which were precisely alike, during all the cycling periods of time. No action, transaction, or set of circumstances, whatsoever, ever corresponded precisely to any other action, transaction, or set of circumstances. This diversity reigns throughout every kingdom of nature, and, it is contended, "mocks at all human attempts to make laws, or constitutions, or regulations, or governmental institutions of any sort, which shall work justly and harmoniously amidst the unforeseen contingencies of the future."

The individualities of objects are least, or, at all events they are less apparent, when the objects are inorganic, or of a low grade of organization. The individualities of the grains of sand which compose the beach, for example, are less marked than those of vegetables, and those of vegetables are less than those of animals, and, finally, those of animals are less than those of man. In proportion as any object is more complex, it embodies a greater number of elements, and each element has its own individualities or diversities in every new combination into which it enters. Consequently these diversities are multiplied into each other, in the infinite augmentation of geometrical progression. Man, standing, then, at the head of the created universe, is consequently the most complex creature in existence—every individual, man or woman, being a little world in him or herself, an image or reflection of God, an epitome of the Infinite. Hence the individualities of such a being are utterly immeasurable; and every attempt to adjust the capacities, the adaptations, the wants, or the responsibilities of one human being by the capacities, the adaptations, or the wants of another human being, except in the very broadest generalities, is unqualifiedly futile and hopeless. Hence every ecclesiastical, governmental, or social institution which is based on the idea of demanding conformity or likeness in any thing, has ever been, and ever will be, frustrated by the operation of this subtile, all-pervading, principle of individuality. Hence, human society has ever been, and is still, in the turmoil of revolution. The only alternative known has been between revolutions and despotism. Revolutions violently burst the bonds, and explode the foundations

of existing institutions. The institution falls before the individual. Despotism only succeeds by denaturalizing mankind. It extinguishes their individualities only by extinguishing them. The individual falls before the institution.

It is affirmed that this indestructible and all-pervading individuality, furnishes, itself, the law and the only true law of order and harmony throughout the universe. When every individual particle of matter obeys the law of its own attraction, and comes into that precise position, and moves in that precise direction which its own inherent peculiarities demand, the harmony of the spheres is evolved. By that means only, natural classification, natural order, natural organization, natural harmony and agreement, are attained. Every scheme or arrangement which is based upon the principle of thwarting the inherent affinities of the individual monads, which compose any system or organism, is essentially vicious, and the organization is false—a mere bundle of revolutionary and antagonistic atoms. If, then, individuality is a universal law which must be obeyed if we would have order and harmony in any sphere, and, consequently, if we would have a true constitution of human government, then the absolute sovereignty of the individual necessarily results. The monads or atoms of which human society is composed, are the individual men and women in it. They must be so disposed of, as we have seen, in order that society may be harmonic, that the destiny of each shall be controlled by his or her own individualities of taste, conscience, intellect, capacity and will. But man is a being endowed with consciousness. He, and no one else, knows the determining force of his own attractions. No one else can, therefore, decide for him; and hence individuality can only become the law of human action by securing to each individual the sovereign determination of his own judgment, and of his own conduct, in all things, with no right reserved either of punishment, or censure, on the part of anybody else whomsoever; and this is what is meant by the "Sovereignty of the Individual," limited only by the ever-accompanying condition, resulting from the equal sovereignty of all others, that the onerous consequences of his actions be assumed by himself.

It would, perhaps, be injudicious to conclude this almost naked statement of the doctrine of "the Sovereignty of the Individual" without a more formal statement of the scientific limit upon the exercise of that sovereignty which the principle itself supplies. If the principle were predicated of one individual alone, the assertion of his sovereignty, or, in other words, of his absolute right to do as he pleases, or to pursue his own happiness in his own way, would be, confessedly, to invest him with the attributes of despotism over others. But the doctrine which I have endeavoured to set forth is not that. It is the assertion of the concurrent sovereignty of all men, and of all women, and within the limits I am about to state, of all children. This concurrence of sovereignty necessarily and appropriately limits the sovereignty of each. Each is sovereign only within his own dominions, because he can not extend the exercise of his sovereignty beyond these limits without trenching upon, and interfering with, the prerogative of others whose sovereignty the doctrine equally affirms. What, then, constitutes the boundaries of

one's own dominions? This is a pregnant question for the happiness of mankind, and one which, it is said, has never, until now, been specifically and scientifically asked and answered. The answer, if correctly given, will fix the precise point at which sovereignty ceases, and encroachment begins; and it is affirmed that that knowledge, accepted into the public mind, will do more than laws and the sanction of laws, to regulate individual conduct and intercourse. The limitation is this: every individual is the rightful sovereign over his own conduct in all things, whenever, and just so far as, the consequences of his conduct can be assumed by himself; or, rather, inasmuch as no one objects to assuming *agreeable* consequences, whenever and as far as this is true of the *disagreeable* consequences. For disagreeable consequences, endurance, or burden of all sorts, the term "*cost*" is elected as a scientific technicality. Hence the exact formula of the doctrine, with its inherent limitation, may be stated thus:—"The Sovereignty of the Individual, to be exercised at his own cost." It results, that wherever such circumstances exist that a person cannot exercise his own individuality and sovereignty without throwing the "cost," or burden of his actions upon others, the principle has so far to be compromised. Such circumstances arise out of connected or amalgamated interests, and the sole remedy is disconnection. The exercise of sovereignty is the exercise of the deciding power. Whoever has to bear the cost should have the deciding power in every case. If one has to bear the cost of another's conduct, and just so far as he has to do so, he should have the deciding power over the conduct of the other. Hence dependence and close connections of interests demand continual concessions and compromises. Hence, too, close connection and mutual dependence is the legitimate and scientific root of despotism, as disconnection or individualization of interests is the root of freedom and emancipation.

If the close combination which demands the surrender of our will to another, is one instituted by nature, as in the case of the mother and the infant, then the relation is a true one notwithstanding. The surrender is based upon the fact that the child is not yet strictly an individual. The unfolding of its individuality is gradual, and its growing development is precisely marked by the increase of its ability to assume the consequences of its own acts. If the close combination of interests is artificial or forced, then the parties exist toward each other in false relations, and to false relations no true principles can apply. Consequently, in such relations, the sovereignty of the individual must be abandoned. The law of such relations is collision and conflict, to escape which, while remaining in the relations, there is no other means but mutual concessions and surrenders of the selfhood. Hence, inasmuch as the interests of mankind have never yet been scientifically individualized by the operations of an equitable commerce, and the limits of encroachment never scientifically defined, the axioms of morality, and even the provisions of positive legislation, have been doubtless appropriate adaptations in the ages of false social relations to which they have been applied, as the cataplasm or the sinapism may be for disordered conditions of the human system. We must not, however, reason, in

either case, from that temporary adaptation in a state of disease to the healthy condition of society or the individual. Much that is relatively good, is only good as a necessity growing out of evil. The greater good is the removal of the evil altogether.

Mr. Warren contends that the doctrine of "Individuality," and "the Sovereignty of the Individual," involves two of the most important scientific consequences, the one serving as a guiding principle to the true solution of existing evils in society, and to the exodus out of the prevailing confusion; and the other as a guiding principle of deportment *in* existing society while those evils remain. The first is that the sovereignty of the individual, or in other words, absolute personal liberty, can only be enjoyed along with the entire disintegration of combined or amalgamated interests; and here the "cost principle" comes in to point out how that disintegration can and must take place, not as an isolation, but along with, and absolutely productive of the utmost conceivable harmony and co-operation. The second is, that while people are forced, by the existing conditions of society, to remain in the close connections resulting from amalgamated interests, there is no alternative but compromise and mutual concession, or an absolute surrender upon one side or the other. While it is the most ultra-radical doctrine in theory and final purpose ever promulgated in the world, it is at the same time eminently conservative in immediate practice. While it teaches, in principle, the prospective disruption of nearly every existing institution, it teaches concurrently, as matter of expediency, a patient and philosophic endurance of the evils around us, while we labour assiduously for their removal. So far from quarrelling with existing government, where it is put upon the footing of temporary expediency as distinguished from abstract principle, and final purpose, it sanctions and confirms it. It has no sympathies with aimless and fruitless struggles, the recriminations of different classes in society, nor with merely anarchical and destructive onslaughts upon existing institutions. It proposes no abrupt and sudden shock to existing society. It points to a scientific, gradual, and perfectly peaceable substitution of new and harmonious relations for those which are confessedly beset, to use the mildest expression, by the most distressing embarrassments.

Having thus briefly touched upon the two first principles propounded by the author of this new theory for the solution of the Social Problem, viz., "*Individuality*," and "*the Sovereignty of every Individual;*" we come now to an exposition of the third principle, which is expressed in the formula "*Cost the limit of Price.*"

Mr. Andrews, the principal writer or commentator on Mr. Warren's theory, whom I have before mentioned and quoted, says of this principle, that "in itself it is one which will not probably strike the reader when first stated, as either very profound, very practicable in its application, or very important in its consequences; nor, perhaps, as even equitable in itself. He avers, however, that when subjected to analysis, and traced into its ten thousand different applications, to ownership, to rent, to wages, &c., that it places all human transactions relating to property upon a new basis of exact justice; that is, it has the perfect, simple, but all-prevailing character of a Universal

"The counter-principle upon which all ownership is now maintained and all commerce transacted in the world is, that '*Value* is the limit of price,' or as the principle is generally stated in the cant language of trade, 'a thing is worth what it will bring.'"

Between these two principles, so similar that the difference in the statement would hardly attract a moment's attention unless it were specially insisted upon, lies the essential difference between the present most unsatisfactory condition of society, and the reign of equity, the just remuneration of labour, and the independence and elevation of all mankind.

"There is nothing (continues Mr. Andrews) apparently more innocent, harmless, and equitable in the world than the statement that "a thing should bring what it is worth," and yet even *that* statement covers the most subtle fallacy which it has ever been given to human genius to detect and expose—a fallacy more fruitful of evil than any other by which the human intellect has ever been clouded."

According to Mr. Warren, *value* has nothing whatever to do, upon scientific principles, with settling the *price* at which any article should be sold. *Cost* is the only equitable limit, and by cost is meant the amount of *labour* bestowed on its production, that measure being again measured by the *painfulness* or *repugnance* of the labour itself.

Value is a consideration for the purchaser alone, and determines him whether he will give the amount of the cost or not.

This statement is calculated to raise a host of objections and inquiries. If one purchaser values an article more highly than another, by what principle will he be prevented from offering a higher price? How is it possible to measure the relative painfulness or repugnance of labour? What allowance is to be made for superior skill or natural capacity? How is that to be settled? How does this principle settle the questions of interest, rent, machinery? &c. What is the nature of the practical experiments which have already been made? &c., &c.

These several questions, and many others, connected with this interesting and important subject, are specifically answered in treatises by Mr. Warren and Mr. Andrews, one of which, by the former of these gentlemen, embodies the "Practical Details" of twenty-four years of continuous experiment upon the workings of the "Cost Principle" and the other principles related to it. These "Practical Details" relate to the operations of several mercantile establishments conducted at different points, upon the "*Cost Principle;*" to the education of children; to social intercourse; and finally to the complex affairs of several villages which have grown up during the last seven years under the system of "Equitable Commerce" of which the cost principle is the basis. These practical details, I may venture to affirm, from a personal knowledge of their character, present a body of facts profoundly interesting to the philanthropic and philosophic student of human affairs.

I shall content myself on this occasion with giving a few sentences mainly from a work of Mr. Andrews, intitled "*The Science of Society,*" illustrative, and in defence, of the principle now more immediately under consideration, viz.,—that Cost is the limit (or scientific measure) of Price.

He starts with the proposition—"That the essential element of beneficent commerce is EQUITY, *or that which is just and equal between man and man.*" He then proceeds:—"The fundamental inquiry, therefore, upon the answer to which alone *a science* of commerce can be erected, is the true measure of equity, or,what is the same thing, the measure of *price* in the exchange of labour and commodities.

This question is one of *immense* importance, and strange to say, it is one which has never received the slightest consideration; which has never, indeed, been raised either by political economists, legislators, or moralists. The only question discussed has been, what it is which *now* regulates price—never, what should regulate it. It is admitted, nevertheless, that the present system of commerce distributes wealth most unjustly. Why, then, should we not ask the question,—what principle or system of commerce would distribute it justly? Why not apply our philosophy to discovering the true system rather than apply it to the investigation of the law according to which the false system works outs its deleterious results?

Simple equity is this, *that so much of* YOUR *labour as I take and apply to* MY *benefit, so much of* MY *labour ought I to give you to be applied to* YOUR *benefit; and, consequently, if I take a product of your labour instead of the labour itself, and pay you in a product of my labour, the commodity which I give you ought to be one in which there is* JUST AS MUCH LABOUR *as there is in the product which I receive.*

The same idea may be differently presented in this manner.—It is equity, that *every individual should sustain just as much of the common burden of life as has to be sustained by anybody on his account.* Such *would* be the result if each produced for himself all that he consumed, as in the first case supposed above; and the fact that it is found convenient to exchange labour and the products of labour, does not vary the definition of equity in the least.

So much for the *principle* of equity. The next step in the investigation is the method of applying it—the means of arriving at the *measure* of equity. If I exchange my labour against yours, the first measure that suggests itself for the relative amount of labour performed by each is the length of time that each is employed. If all pursuits were equally laborious, or, in other words, if all labour were equally repugnant or toilsome—if it *cost* equal amounts of human suffering or endurance for each hour of time employed in every different pursuit, then it would be exact equity to exchange one hour of labour for one other hour of labour, or a product which has in it one hour of labour for another product which has in it one hour of labour the world over. Such, however, is not the case. Some kinds of labour are exceedingly repugnant, while others are less so, and others again are pleasing and attractive. There are differences of this sort which are agreed upon by all the world. For example,—sweeping the filth from the streets, or standing in the cold water and dredging the bottom of a stream, would be, by general consent, regarded as more repugnant, or, in the common language on the subject, *harder work*, than laying out a garden, or measuring goods.

But besides this general difference in the *hardness* or *repugnance* of work, there are individual differences in the feeling towards

different kinds of labour which make the *repugnance* or *attraction* of one person for a particular kind of labour quite different from that of another. Labour is repugnant or otherwise, therefore, more or less, according to the *individualities* of persons.

It follows from these facts, that equity in the exchange of labour, or the products of labour, cannot be arrived at by measuring the labour of different persons *by time* merely. Equity is the equality of burdens according to the requirements of each person, or, in other words, the assumption of as much burden by each person as has to be assumed by somebody, on his account, so that no one shall be living by imposing burdens upon others. Time is one element in the measurement of the burdens of labour, but the different degrees of repugnance in the different kinds of labour prevent it from being the only one. Hence it follows that there must be some means of measuring *this repugnance itself*—in other words, of determining the relative *hardness* of different kinds of work, before we can arrive at an equitable system of exchanging labour, and the products of labour. If we could measure the general *average* of repugnance, that is, if we could determine how people generally regard the different kinds of labour as to their agreeableness or disagreeableness, still that would not insure equity in the exchange between individuals, on account of those *individualities of character and taste* which have been adverted to. It is an equality of burden between the *two* individuals who exchange, which must be arrived at, and *that* must be according to the estimate which *each* honestly forms of the repugnance to *him* or *her* of the particular labour which he or she performs, and which, or the products of which, are to be exchanged.

It is important, for reasons of practical utility, to arrive at a *general*, or *average*, estimate of the relative repugnance of different kinds of labour, especially of the most common kinds, and that has been, and is done, under the operations of the cost principle, at the "Equitable Villages," which have been, and are now, in operation in America. But, as we have seen, this even would not be a sufficiently accurate measure of equity to be applied between *individuals;* while on the other hand, this average itself can only be based upon individual estimates.

It follows, therefore, in order to arrive at a satisfactory measure of equity, and the adoption of a scientific system of commerce:—

1. That some method must be devised for comparing the relative repugnance of different kinds of labour.

2. That in making the comparison, *each individual* must make his or her own estimate of the repugnance to him or her of the labour which he or she performs, &c.

3. That there should be a sufficient motive in the results, or consequences, to insure an honest exercise of the judgment, and an honest expression of the real feelings of each, in making the comparison.

As to the first condition—the devising some method by which to compare the relative repugnance of different kinds of labour. This is extremely simple. All that is required is to agree upon some particular kind of labour, the average repugnance of which is most easily ascertained, or the most nearly fixed, and use it as a *standard of*

comparison, a sort of *yard-stick* for measuring the relative *repugnance* of other kinds of labour. For example, in the western American states it is found that the most appropriate kind of labour to be assumed as a standard with which to compare all other kinds of labour is corn-raising. It is also found, upon extensive investigation, that the average product of that kind of labour, in that region, is *twenty pounds of corn to the hour*. If, then, blacksmithing is reckoned as one-half harder work than corn-raising, it will be rated (by the blacksmith himself) at *thirty pounds of corn to the hour*. If shoe-making be reckoned at one-quarter less onerous than corn-raising, it will be rated at *fifteen pounds of corn to the hour*. In this manner the idea of corn-raising is used to measure the relative repugnance of all kinds of labour.

The second condition—reserving to each individual the right of making his or her estimate of the comparative repugnance to him or to her, of the particular labour which he or she performs, is necessary both for the reasons already stated, and because another equally important principle in the true science of society is the sovereignty of the individual. The individual must be kept absolutely above all institutions. He must be left free even to abandon the principles when he chooses. The only constraint must be in the attractive nature and results of true principles.

The third condition was stated to be—"that there should be a sufficient motive in the results or consequences of compliance with these principles to insure an honest exercise of the judgment, and an honest expression of the real feeling of each in making his estimate of the relative repugnance of his labour." The existence of such a motive can only be shown by a view of the general results of this entire system of principles upon the condition of society, and upon the particular interests of the individual. These results must be gathered from a thorough study of the whole subject, in order to establish this point conclusively to the philosophic mind. The force of a public sentiment, rectified by the knowledge of true principles, will not be lost sight of by such a mind."

I shall not detain you by a statement of the particular remedial results of deviations from the principles of equity upon the interests of individuals, but they are specifically pointed out in the work of Mr. Andrews.

Especial attention is directed to the technical distinction between *value* and *cost*—a point of great importance to the whole discussion.

"What a thing is worth," is another expression for the value of a commodity or labour. The *value* of a commodity, or labour, is *the degree of benefit which it confers upon the person who receives it, or to whose use it is applied*. The *cost* of it is, on the other hand, as already explained, *the degree of burden which the production of the commodity, or the performance of the labour, imposed upon the person who produced or performed it*. They are, therefore, by no means the same. No two things can possibly be more distinct. The burden or cost may be very great, and the benefit or value very little, or *vice versâ*. In the case of an exchange or transfer of an article from one person to another, the cost relates to the party who makes the transfer, the burden of the production falling on him, and the *value* to the party

to whom the transfer is made, the article going to his benefit. It is the same if the object exchanged is labour directly. It follows, therefore, that to say that "a thing should bring what it is worth," which is the same as to say that "*its price should be measured by its value*," is quite the opposite of affirming that it should bring *as much as it cost the producer to produce it.* Hence both rules cannot be true, for they conflict with and destroy each other. It is affirmed, however, that *cost* is the true and *value* the false measure of price, and the author seeks to establish this by a most logical disquisition and a comparison of the consequences of the two principles in operation.

It is admitted that although value is not the legitimate limit of price, nor even an element in the price, it is nevertheless an element in the bargain. *It is the value of the thing to be acquired which determines the purchaser to purchase.* It belongs to the man who labours, or produces an article, estimating for himself, as we have seen, the amount of burden he has assumed, to fix the price measured by that burden or cost. He alone knows it, and he alone, therefore, can determine it. It belongs, on the other hand, to the purchaser to estimate for himself the value of the labour or commodity to him. He alone can do so in fact, for he alone knows the nature of his own wants. By the settlement of the first point—the cost to the producer—the price becomes a fixed sum. If the value then exceeds that sum in the estimation of the other party he will purchase, otherwise not. Hence the value, though not an element in the price, is an element in the bargain. The price is a consideration wholly for the vendor, and the value a consideration wholly for the purchaser. Hence it follows that both *value* and *cost* enter into a bargain, even when legitimately made. But *value* goes solely to determine the *demand*, and is solely cognizable by the *purchaser* or *consumer*—by *him who receives;* while *cost* (or *burden*) goes to determine the *price*, and is solely cognizable by the *seller* or *producer*—by *him who renders.* By this means the cost of each one's acts is made to fall upon himself, which is the essential condition of the rightful exercise of the sovereignty of the individual. If you over-estimate the value to you of my services, you endure the cost or disagreeable consequences of your mistake or want of judgment. If I, on the other hand, under-estimate the cost or endurance of the performance to me, the cost of that error falls on me, submitting each of us to the government of consequences, the only legitimate corrective. If, again, I over-estimate the cost to me, and ask a price greater than your estimate of the value to you, there is no bargain, and I have lost the opportunity of earning a price measured by the real cost of the performance, so that the cost of my mistake again falls on me; while, the market being open, and a thorough adjustment of supply to demand being established, others will make a juster estimate, whose services you will procure and you will suffer no inconvenience. Competition will regulate any disposition on my part to overcharge.

All this is reversed in our existing commerce. The vendor adjusts his price to what he supposes to be its value to the purchaser, that is to the degree of want in which the purchaser is found, never to

what the commodity cost himself; thus interfering with what cannot concern him, except as a means of taking an undue advantage. The purchaser, on the other hand, offers a price based upon his knowledge or surmise of what the degree of want of the vendor may force him to consent to take.

As respects the propriety of measuring price by value, it is, in the first place, stated to be *essentially impossible to measure value* EXACTLY, or, in other words, to ascertain the precise WORTH of labour or commodities; and that, in the next place, if it *were* possible to measure values precisely, *the exchange of commodities according to value would still be a system of mutual conquest and oppression*, not a beneficent reciprocation of equivalents. And this is illustrated by the following, among other examples:—

"Suppose I am a wheelwright, in a small village, and the only one of my trade. You are travelling with certain valuables in your carriage, which breaks down opposite my shop. It will take an hour of my time to mend the carriage. You can get no other means of conveyance, and the loss to you, if you fail to arrive at the neighbouring town in season for the sailing of a certain vessel, will be $500, which fact you mention to me, in good faith, in order to quicken my exertions. I give one hour of my work and mend the carriage. What am I, in equity, entitled to charge—what should be the *limit of price* upon my labour?

Let us apply the different measures and see how they will operate. If *value* is the limit of price then the price of the hour's labour should be $500. That is the equivalent of the value of the labour to you. If *cost* is the limit to price, then you should pay me a commodity, or commodities, or a representative in currency which will procure me commodities, having in them one hour's labour, equally as hard as the mending of the carriage, without the slightest reference to the degree of benefit which that labour has bestowed upon you; or, putting the illustration in money thus:—assuming twenty-five cents to be an equivalent for an hour's labour of an artizan in that particular trade, then, according to the *cost principle*, I should be justified in asking only twenty-five cents, but according to the *value principle*, I should be justified in asking $500.

The *value principle*, in some form of expression, is, as I have said, the only *recognized* principle of trade throughout the world. "A thing is worth what it will bring in the market." Still, if I were to charge you $500, or a fourth part of that sum, and, taking advantage of your necessities, force you to pay it, everybody would denounce me, the poor wheelwright, as an extortioner and a scoundrel. Why? Simply because this is an *unusual* application of the principle. Wheelwrights seldom have a chance to make such a "speculation," and therefore it is not according to the "established usages of trade." Hence its manifest injustice shocks, in such a case, the common sense of right. Meanwhile you, a wealthy merchant, are daily rolling up an enormous fortune by doing business upon the same principle which you condemn in the wheelwright, and nobody finds fault. At every scarcity in the market you immediately raise the price of every article you hold. It is your *business* to take advantage of the necessities of those with whom you deal, by selling

to them according to the *value* to them, and not according to the *cost* to you. You go further. You, by every means in your power, create those necessities, by buying up particular articles and holding them out of the market until the demand becomes pressing, by circulating false reports of short crops, and by other similar tricks known to the trade. This is the same in principle as if the wheelwright had first dug the rut in which your carriage upset, and then charged you the $500.

It is contended that "the value principle" is the commercial embodiment of the essential element of conquest and war,—war transferred from the battle-field to the counter, none the less opposed, however, to the spirit of christian morality, or the sentiment of human brotherhood. In bodily conflict the physically strong conquer and subject the physically weak. In the conflict of trade the intellectually astute and powerful conquer and subject those who are intellectually feeble, or whose intellectual developement is not of the precise kind to fit them for the conflict of wits in the matter of trade. With the progress of civilization and developement we have ceased to think that superior physical strength gives the *right* of conquest and subjugation. We have graduated, in idea, out of the period of physical dominion. We remain, however, as yet in the period of intellectual conquest or plunder. It has not been questioned hitherto, as a general proposition, that the man who has superior intellectual endowments to others, has a right, resulting therefrom, to profit thereby at the cost of others. In the extreme applications of the admission only is the conclusion ever denied. In the whole field of what are denominated the legitimate operations of trade, there is no other law recognized than the relative "smartness or shrewdness" of the parties, modified at most by a sentimental precept, such as an exhortation to be "fair" in your dealings. The *sentiment* of honesty exists, but the *science* of honesty is wanting. The sentiment is first in order. The science must be an outgrowth, a consequential developement of the sentiment. The precepts of christian morality deal properly with that which is the soul of the other, leaving to intellectual investigation the discovery of its scientific complement.

The following, among others, are the objectionable consequences which flow from the principle of making value, instead of *cost*, the rule of price; and every one of which consequences, it is affirmed, are reversed by the operation of the cost principle:—

1. It renders falsehood and hypocrisy a necessary concomitant of Trade.
2. It makes the rich richer, and the poor poorer.
3. It creates trade for trade's sake, and augments the number of non-producers, whose support is chargeable to labour.
4. It degrades the dignity of labour.
5. It prevents the possibility of a scientific adjustment of supply to demand.
6. It renders competition destructive and desperate.
7. It renders the induction of new machinery a wide-spread calamity, instead of a universal blessing.

The importance and novelty of the three first principles pro-

pounded by Mr. Warren, as the solution of the social problem—namely, "Individuality," "the Sovereignty of the Individual," and "Cost the limit of Price," must plead my excuse for having occupied so much of the time accorded me, to their elucidation, and for the necessary brevity with which I shall notice the two remaining principles, and which will explain to you the "Circulating Medium" adopted in these "Equitable Villages," and the means taken to adapt the supply to the demand.

Money has professedly two uses,—one as a standard of value, and another as a circulating medium. Now, in the system of equitable commerce, money, as at present used, is rejected as being too uncertain and fluctuating in its nature to be a *standard;* and (so far as gold and silver are concerned), as not being convenient as a circulating medium. A critical investigation on these points is gone into in the works of Mr. Warren and Mr. Andrews, the result of which is stated to be, first,—that the product of gold, and for the same reason silver, is quite unfit for our purpose, which is the selection of a staple species of labour with which to compare other labour, while it is shown that corn or wheat does fulfil the required conditions; and, secondly, that paper is just suited as a circulating medium, provided it can be made to rest upon a proper basis, and represent what *ought* to be represented by a circulating medium.

"Now what is it which *ought* to be represented by a circulating medium? Clearly it is *price*—the price of commodities. The pledge or promise should be exactly equivalent to, as it stands in the place of, the commodity or commodities to be given hereafter. These commodities, which the paper stands in the place of, are the *price* of what was received. The equitable limit of price it is contended is the *cost* of the articles received. The promise is, therefore, rightly the equivalent of, or goes to the extent of, the *cost* of the articles received. But the *cost* of an article is, we have seen, the *labour* there is in it, *rightly measured.* Every issue of the circulating medium should therefore be a representative of, or pledge for, a certain amount of human labour, or for some commodity which has in it an equal amount of human labour; and to avoid all question about what commodity shall be substituted, it is proper that a staple or standard article, the cost of which all agree upon, should be selected."

"The first point," says Mr. Andrews, "is to obtain a standard for a single locality, after which it is quite easy to adjust the standard of other localities to it. Agricultural labour is first selected, because it is the great staple branch of human industry. The most staple article of agricultural product is, then, taken, which for America, and especially for the great valley of the Mississippi, is Indian-corn. In another country it may be wheat, or something else, although Indian corn, wherever it is produced, will be found to have more of the appropriate qualities for a standard than any other article whatsoever, being more invariable in quality, more uniform in the amount produced by the same amount of labour in a given locality, and more uniform in the extent of the demand than any other article. At a given locality, or, as I have stated, at a great variety of localities in the western states, the standard product of Indian-corn is twenty pounds to the hour's labour, the measurement by pounds being also

more inflexible or less variant than that by bulk. If, then, in some other locality, as, for example, New England, the product of an hour's labour devoted to raising corn is only ten pounds of corn, the equivalent of the standard hour's labour *there* will be ten pounds of corn, while in the west it will be twenty pounds. It is the hour's labour, in that species of agriculture, which is therefore the actual unit of comparison, of which the product, whatever it may be, is the local representative. And, in the same manner, in another country wheat may be the standard, as, for example, in England, and may be reckoned at ten pounds to the hour, or whatever is found by trial to be the fact. The reduction of the standard of one locality to that of another, will then be no more difficult than the reduction of different currencies to one value, as now practised."

There is an absolute necessity for some standard of *cost*, and it is not a question of principle but of expediency what article is adopted. It is the same necessity which is recognized at present for a standard of *value*, which is sought for, and by some persons erroneously supposed to be found in money.

Now, if an exchange could be always made and completed on the spot, each party giving and receiving an equivalent in labour or the product of labour, the whole problem of exchanges would be solved by this simple method, and there would be no necessity for a circulating medium, or for anything to perform the part which is performed by money in our existing commerce. But such is not the case. Ordinarily the exchange is only partially completed on the spot, the remaining part *waiting to be completed at some future time*, by the performance of an equivalent amount of labour, or the products or commodities having in them an equivalent amount of labour.

In such a case as that just stated, it is proper that the party who does not make his part of the exchange on the spot, should give *an evidence of his obligation to do so at some future time*, whenever called upon—and this is the origin of what is called the labour note, which is the form assumed by "Equitable Money," the fourth among the elements of the solution of the problem of society. The party who remains indebted to the other gives his own note, *provided the other consents to receive it*, for an equivalent amount of his own labour, or else of the standard commodity—say so many pounds of corn, specifying in the note the kind of labour, and the alternative. As it may happen that the party receiving the labour note may not require the labour itself, or that it may be inconvenient for the party promising to perform it when it is wanted, it is provided that the obligation may be discharged, at the option of the party giving the note, in the standard commodity instead. On the other hand, although the party receiving the note may not want the labour himself, yet some person with whom he deals may want it, and hence he can pass the note to a third party who is willing to receive it for an equivalent amount of labour, or products, received from him. In this manner the labour note begins to circulate from one to another, and the aggregate of labour notes in circulation in a neighbourhood constitutes the neighbourhood's circulating medium, dispensing, so far as this equitable commerce extends, with money altogether, or, rather, introducing a *new species of paper-money, based solely on individual responsibility.*

The use of the labour note is not strictly a *principle of equity*, but partakes more of the nature of a contrivance than any other feature of the system of equitable commerce; but yet it seems to be a necessary instrument to be employed in the practical working of the system. The *theory* of equity is complete without it, but the necessity for its use arises from the practical fact that exchanges cannot in every case be completed on the spot. Hence a circulating medium of some sort is indispensable; and in order that the system may remain throughout an equitable one, in practice as well as in theory, the circulating medium must be based *on equivalents of labour or cost between individuals.*

The features of the labour note are peculiar, and the points of difference between it and ordinary money are numerous and far more important than at first sight appears. They are as follows:—

1. Its cheapness and abundance.
2. Being based on individual credit it makes every man his own banker.
3. It combines the properties of a circulating medium, and a means of credit.
4. It represents an ascertained and definite amount of labour or property, which ordinary money does not.

I have no time to amplify on these several heads, but for further information must refer my hearers to the works which have been published upon the subject.

I come now to the consideration of the fifth and last principle in "Equitable Commerce," which is "*the adaptation of the supply to the demand.*"

Treating of this part of his subject, Mr. Warren says:—"In society where even the first elements of order had made their way to the intellects of men, there would be some point at which all would continually make known their wants, as far as they could anticipate them, and put them in a position to be supplied; and all who wanted employment would know where to look for it, and the *supply would be adapted to the demand.* We should not then have *all* the flour carried *out of the country where it was raised*, so that none could be had (as at this moment while I am writing) and carried a thousand miles in anticipation of higher prices. This rush of flour has "*exceeded the demand*"—"prices have fallen"—twelve hundred barrels have spoiled in one man's hands, and two thousand barrels are on their way back to the place of production! where, after having been stored, and booked, and drayed, and shipped to New Orleans, and there unshipped, and drayed, and stored, and booked, and waiting for a *demand*, it is again drayed, and shipped, and brought back to be unshipped, drayed, and stored, and booked, and sold, half spoiled, to its original producers, for all its first cost, with all these expenses added, and as much more as the holders "can get." This is the *economy* of our present profit-making commerce.

"The adaptation of the *supply to the demand*, although it is continually governing the bodies of men, seems never to have made its way into their intellects, or they would have made it the governing principle of their arrangements. It is this which prompts almost every action of life, not only of men, but other animals—insects—

all animated nature. All man's pursuits originate in his efforts to supply some of his wants, either physical mental, or moral; even our intellectual commerce is unconsciously governed by this great principle, whenever it is harmonious and beneficial; and it is discordant and depreciating when it is not so regulated. An answer to a question is but a supply to a demand. Advice, *when wanted*, is acceptable, but never otherwise—COMMANDS are never in this order, and produce nothing but disorder. The sovereignty of the individual must correct this."

Mr. Andrews contends that "there is no reason in the nature of the case why there should not be as accurate a knowledge in the community of the statistics of supply and demand, as there is of the rise and fall of the tides, nor why that knowledge should not be applied to secure a minute, punctual, and accurate distribution of products over the face of the earth, according to the wants of various countries, neighbourhoods and individuals. *The supposed excess of labour is no more an excess than congestion is an excess of blood in the human system.* The scarcity of the circulating medium which is now in use, and which is requisite for the interchange of commodities, is regarded by those who have studied this subject profoundly as the principal difficulty in the way of such an adjustment, but that scarcity itself is only a specific form and instance of the general want of adaptation of supply to demand, which extends far beyond all questions of currency—the supply of circulating medium being unequal to the demand for it, owing to the expensiveness of the substances selected for such a medium, and their consequent total unfitness for the purpose.

It follows from what has been said, that appropriate arrangements for the adaptation of supply to demand are a *sine quâ non* of a true social order. But the existence of such arrangements is an impossibility in the midst of the prevalence of speculation. But speculation has always existed, and is inherent in the present commercial system, and consequently no adequate adjustment of supply to demand has ever been had, or can ever be had, while that system remains in operation. It is the business of speculation, and hence of the whole mercantile profession, to confuse and becloud the knowledge of the community upon this very vital point of their interests, and to derange such natural adjustment as might otherwise grow up, even in the absence of full knowledge on the subject—to create the belief that there is excess or deficiency when there is none, and to cause such excess or deficiency, in fact, when there would otherwise be none, in order to buy cheap and sell dear. Speculation is not only the vital element of the existing system of commerce, but it will always exist upon any basis of exchange short of the cost principle, and this extinguishes speculation.

I have now finished my sketch of the principles of "Equitable Commerce," and I wish to draw attention to the fact as vouched by their discoverer, Mr. Warren, and their expounder, Mr. Andrews, that there is no one of this circle of principles which has not been patiently, repeatedly, and successfully applied in practice, in a variety of modes, during the last eight-and-twenty years, and long before it was announced in theory—a point in which, it is thought, these principles differ materially from all the numerous speculations upon

social subjects to which the attention of the public has been heretofore solicited.

An integral view of the connections of the different parts of this system of principles can only be a final result of a thorough familiarity with their detailed applications and practical effects. It is averred, with great emphasis, that there exists so intimate a relation between them, that if any one of them is omitted, it is impossible to work out the proposed results. The others will remain true, but any one of them, or any four of them, are wholly inadequate to the solution.

In conclusion, allow me to say that time has not permitted me to give more than the faintest glimpse of a subject which I deem of the greatest importance to the human family. I have ventured thus much, however, in the hope of exciting sufficient interest to induce some of the acute and inquiring minds among my auditors to procure the very few and uncostly works which have been published on the subject,* and make it, as I am doing, a study. I do not profess to be able to *defend all* the principles enunciated, although after considerable attention, and with a mind prepossessed against some of them, I confess I should find it difficult to *confute any*.

In the language of Mr. Andrews,—the very able expositor of the system,—when alluding more especially to "Cost as the limit of Price,"—"A thousand objections will occur which it is impossible to remove at the time of stating the general outline. It will be perceived by the acute intellect that a principle is here broached which is absolutely revolutionary of all existing commerce. Perhaps a few minds may follow it out at once into its consequences far enough to perceive that it promises the most magnificent results in the equal distribution of wealth proportioned to industry—the abolition of pauperism—general security of condition instead of continual bankruptcy or poverty—universal co-operation—the general prevalence of commercial honour and honesty, and in ten thousand harmonizing and beneficent effects, morally and religiously. The larger class of persons, however, will require that each particular detail shall be traced out and defined; and the mass of mankind will only understand the subject upon the basis of practical illustration. Hence the necessity that the practice go along with the theory, a method which has been generally adopted and pursued, and of the results of which the public will be from time to time sufficiently advised."

* 1. "The Science of Society, in two parts. Part I.—The true constitution of Government in the Sovereignty of the Individual as the final development of Protestantism, Democracy, and Socialism. Part II.—Cost the limit of Price, a scientific measure of honesty in trade, as one of the fundamental principles in the solution of the social problem. By Stephen Pearl Andrews." Published by Fowler and Wells, New York. Price, in cloth, $1.

2. "Equitable Commerce. A new development of principles for the harmonious adjustment and regulation of the pecuniary, intellectual, and moral intercourse of mankind, proposed as elements of new society. By Josiah Warren." Price 25 cents.

3. "Practical Details in Equitable Commerce." An interesting account of the actual working of the principles laid down in the former work. Price 25 cents.

4. "The Periodical Letter, on the Principles and Progress of the Equity Movement." Published monthly, commencing July, 1854. By Josiah Warren. Thompson, P. O., Long Island, New York.

The Laws of the Currency in Scotland. By J. W. Gilbart, Esq., F.R.S.

[Read before the Statistical Section of the British Association at Glasgow, on Saturday, the 15th of September, 1855.]

By the currency of Scotland we mean the notes issued by the banks in Scotland. And by the laws of the currency we mean the uniform operations of those circumstances which regulate the amount of notes kept in circulation.*

In this paper we shall notice—*First*, the constitution of the banks by whom the notes are issued. *Secondly*, the banking operations by which the notes are put into circulation. *Thirdly*, the laws which regulate the fluctuations in the amounts. *Fourthly*, the effects of the Act passed in 1845 for regulating the currency in Scotland.

I.—*The Constitution of the Banks in Scotland that issue Notes.*

With the exception of one private bank in Edinburgh, all the banks in Scotland are banks of issue. In the year 1826, the number of issuing banks in Scotland was *thirty-two*. Now, they are only seventeen, although twelve new banks of issue have since been formed.

Number of issuing banks in 1826. (See Appendix No. I.)	32
Issuing banks since formed. (See Appendix No. II.)	12
	44
Failed, wound up, or merged in other banks.....	27†
Present number of banks. (See Appendix No. III.)	17

1. *These Banks are all Joint Stock Banks.*—By a Joint Stock Bank we mean that there is a certain amount of paid up capital; that this capital is contributed by a number of partners or shareholders in proportion to the shares they hold; that in case any partner retires, or dies, his capital is not withdrawn, but merely transferred to another party; and that all these partners or shareholders are answerable, to the whole extent of their property, for all the debts of the bank (See Appendix No. IV.)

2. *These Banks have numerous Partners.*—By the returns of 1826, it appears that many of the banks had only few partners although styled Joint Stock Banks. But a joint stock bank with few partners has but little better chance than a private bank of obtaining immortality. Most of these banks have ceased to exist. Of the present banks there are only one which has fewer than a hundred partners (See Appendix No. III.) As every partner is answerable for all the debts of the bank to the whole extent of his property, the greater the number of partners, *ceteris paribus*, the greater the security to the public.

Where the banks are few, the bank is conducted by the principals.

* When we have ascertained any conformity in the recurrence of certain events we call that Uniformity and Law. Thus those uniformities that have been found to occur in regard to deaths at various ages are called "The *Laws* of Mortality."—*Logic for the Million.*

† See a list of these banks in "A Practical Treatise on Banking," by J. W. Gilbart, 6th edition, p. 541.

Where the partners are many, the bank is conducted by a Board of Directors, and a chief officer, usually styled a Manager.

Among the objections to joint stock banks, it has been said that directors and managers cannot possibly feel the same interest in their success as the private bankers.* But it may be questioned whether banking is not a business which is usually more prudently conducted by agents than by principals. A man should govern a bank as he would play a game of chess. He should observe with incessant vigilance, but with the most frigid coolness, every opportunity of obtaining success; but he should always move according to the rules of the game, and whether he win or lose retain his equanimity. Extreme anxiety about success, fondness for speculation, private friendships, the desire of amassing wealth, or the dread of losing caste, are disturbing elements in a banker's mind, and have been the causes of many of the follies, the crimes, and the bankruptcies of the private bankers.

Even in the administration of joint stock banks, it has been supposed that when the directors have a large personal interest in the bank which they govern, there is a danger that their feelings as shareholders will sometimes bias their judgment as directors. In the Bank of England no director holds a larger amount of stock than his qualification.

3. *These Banks have large paid up Capitals.*—Of all the joint stock banks in England, there is only one (the London and Westminster Bank) whose paid-up capital amounts to 1,000,000*l.* sterling. But among the seventeen banks of Scotland, there are six which have a paid-up capital of 1,000,000*l.*; one of 1,500,000*l.*; and one of 2,000,000*l.*; the total amount of paid-up capital is 11,701,997*l.*, making an average of 688,352*l.* (see Appendix No. III.)

Our legislators are desirous that banks in England should have large capitals, and hence they have enacted that no new joint stock banks shall be established with a less capital thon 50,000*l.* But a bank with a large capital must have large transactions, and a large field for its operations. And if it be a sound principle that banks should have large paid-up capitals (as we think it is), then restrictions upon the number of partners, restrictions upon the circulation, restrictions upon branches, and restrictions upon the union of banks, are enactments pre-eminent in absurdity.

On the other hand, our English shareholders exclaim, "What do our directors want with a large capital? Is not all our property liable? Is not that security enough?" And they fondly imagine they might take back half their capital, and yet have the same sum as before distributed among them in the form of dividends. How delightful, this! It reminds us of the man who ripped up the goose that laid the golden eggs. Whether that man were a shareholder in an English joint stock bank, we do not know; but he was a man who was dissatisfied with his golden dividends. He would have possession of his capital, and by grasping at the capital he lost the dividends.

We think that the paid-up capital of a bank should bear some proportion to the amount of its liabilities. A bank having large transactions and a small capital, may incur losses exceeding the

* See the evidence of a private banker before the Bank Charter Committee of 1832.

amount of its capital. The total amount of paid-up capital in all the banks of Scotland, we have stated to be 11,701,997*l.*: the amount of notes they are authorized to issue is 3,087,209*l.* The amount of their deposits was estimated by Mr. Blair, in the year 1841,* at 27,000,000*l.* So their paid-up capital is above one-third the amount of their liabilities. This, as far as we know, is much higher than the proportion that obtains in our English banks. Of the paid-up capital of the private banks we know nothing, and the country joint stock banks rarely publish the amount of their deposits. But we know the amount of the paid-up capitals, and of the deposits, of the joint stock banks of London (see Appendix No. V.) And here we find that the paid-up capital of the London and Westminster Bank is only one-eighth of its liabilities; that of the London Joint Stock Bank less than one-tenth; of the Union Bank of London about one-fourteenth; of the Commercial about one-fourth; of the London and County about one-ninth; and of the Royal British Bank about one-tenth.

The mania of shareholders in English banks in favour of small capitals, small surplus funds, and high *pro rata* dividends, and the readiness of boards of directors to pander, in this respect, to the morbid cravings of the shareholders, can be regarded by patriots and statesmen in no other view than as a national calamity (see Appendix No. VI.)

It is undoubtedly by means of their large paid-up capitals that the banks of Scotland have obtained so great a share of public confidence. We recommend the example to our English banks. The unlimited liability of the shareholders does not supercede the expediency of large capitals. It is all very pretty, in times of prosperity, for the shareholders to exclaim—"Is not all our property answerable for the debts of the bank?" But no shareholder is willing to have his property so applied. And in times of adversity, when it seems probable that some portion of this vaunted property will be called upon for this purpose, away go the wealthy shareholders, they sell out as fast as they can, or transfer their shares to some poor relation; and the sum required to pay the creditors of the bank can be obtained only from the remaining shareholders, by a legal process which is always very slow, and not always very sure.

4. *These Banks are few in number* (see Appendix No. III.)—And this too in a country where, until 1845, there was unlimited freedom of banking. How startling this fact must be to those who have told us, that if there were no restrictions upon the formation of joint stock banks, they would be as numerous as gin-palaces. But history tells us that where banking is free, the banks are few, and when banks are numerous, it is the effect of legislative enactments. In England the banks are numerous, because in the renewal of the charter of the Bank of England, in 1708, it was enacted, that no other bank having more than six partners, should have the privilege of issuing notes. And as banks having more than six partners could not be formed, a great number of banks, each not having more than six partners, rose into existence, as they were required by the increasing trade and wealth of the country. In the United States of America there are numerous banks. For no bank can be estab-

* See evidence before the Committee on Banks of Issue.

lished without a charter; and as the state legislatures have thought proper to grant a large number of charters, of course there are numerous banks. We may give another illustration. In London, any number of persons not exceeding six may establish a bank of deposit. Yet, for many years past, the number of London banks has not increased. In the year 1810, the number of clearing bankers was forty-six. At present the number of private banks, who attend the clearing-house, is only twenty-five. In Scotland, banking is free, and the banks are few. The doctrine that freedom in banking leads to an excessive multiplication of banks, is a theory wholly unsupported by the testimony of experience.

5. *These Banks have many Branches* (See Appendix No. III.)—It is undeniably true that it is better for a country to have few banks, with many branches, than a great number of small independent banks. One advantage is, that there is greater security to the currency. Where there are numerous small banks, there will be occasional, and probably numerous failures. And if their capitals are small, they will sometimes lose more than their capital, and then the holders of their notes may suffer loss. But the various branches of a bank are interlaced together, and if one branch sustains loss the profits of the other branches are a compensation, and possibly in a few years the less fortunate branch may recover its losses. The whole capital of the bank is a security to the public for the notes issued at any of the branches. Hence local losses do not affect the public. The shareholders, perchance, get a less dividend, but the bank goes on as before.

The banks of Scotland have large paid-up capitals and numerous branches. These should always go together. A bank that has numerous branches should have a large paid-up capital. A bank that has a large paid-up capital should be established in a large town or city, and extend its branches into districts too poor to form strong banking institutions for themselves. This would give the less wealthy towns and districts the conveniences and security of the large capital of the parent bank, and prevent the formation of small and feeble banks in those localities.

We may observe that the head-quarters of all the banks of Scotland are in large towns or metropolitan cities. Of the seventeen Banks, six are in Edinburgh, four in Glasgow, two in Perth, two in Dundee, two in Aberdeen, and one in Inverness. In looking at Appendix No. I. we may observe that Scotland has not been successful in preserving small local banks. Those who since 1826 have failed, have wound up, or have found it convenient to merge in larger establishments, are by no means few. Private banking, too, has been tried and found wanting. Of the four private banks that existed in Edinburgh, in the year 1826, only one remains and that is now the only one in Scotland. The management of the currency in Scotland has been immeasurably superior to that of England—an advantage for which Scotland is indebted to the non-interference of the legislature. But it is a mistake to suppose that, in banking, Scotland has escaped the casualties that belong to the craft. The large profits made during the last war are supposed to have arisen, not so much from the operations of banking, as from investments in the English

funds. And in the commercial and manufacturing places, such as Aberdeen, Dundee, Glasgow, Paisley, and Greenock, the losses sustained by the banks have occasionally been very severe, and if known, they would probably, in proportion to the amount of transactions, bear a respectable comparison with the losses sustained in similar places by English banks. But the Scotch banks have never been in the habit of publishing their accounts, and the public do not require it. The shareholders are satisfied that the directors and managers know how to govern the banks better than themselves. But in all the vicissitudes of banking, nothing has ever occurred to shake the confidence of Scotland in her banking institutions. Mr. Thomas Kinnear observed, that it required more skill to manage a bank in England than in Scotland, as the English banker had always to be on his guard against a withdrawal of public confidence, a danger from which the banks of Scotland are altogether exempt.

II.—*The Banking Operations by which these Notes are placed in Circulation.*

1. *Current Accounts.*—These are sometimes called "Running Accounts," and by the Bank of England, "Drawing Accounts."

The party having the account pays in to his credit bills, gold, or notes, and draws out the sums for which he has occasion. And as all the bankers' payments are made in his own notes, the effects are, that all the previously existing currency is displaced, and the banker's notes are substituted in its stead.

This effect is produced and maintained more rapidly and effectively by the allowance of interest on the daily balance. When we say the banks of Scotland allow interest on current accounts, we do not mean that they allow interest, as is the case with some banks in London, merely on the lowest sum that may be to the credit of the account on any one day during the month, or during six months; they allow interest from day to day on the full amount of the daily balance. Hence it is the practice for all parties having such accounts to pay into the banks, every afternoon, all the cash they have in their possession, and to draw out on the following morning the notes for which they may have occasion. By this means they get a day's interest on the sums they have placed to their credit.

This practice is facilitated by the exemption from any charge for commission. The country banks in England charge a commission upon the amount of the debit side of a current account. Hence it is the advantage of a party who receives bank-notes, to pay them away to other parties, without passing them through his banking account. In Scotland no such charge is made, and therefore the notes received are not again paid away. Indeed, a party would not be thought to use his own banker well, who should pay away the notes of another bank. He is expected to pay in such notes to his credit, and to make all his payments in the notes of the bank with which he keeps his account.

2. *Deposit Receipts.*—These deposits are usually small sums placed in the bank by parties who have generally accumulated them by their industry, and which are placed in the bank for safety and for interest. Their effect upon the currency is the same as that

produced by current accounts. But the transactions are for smaller amounts, and the operations are far less frequent. Among the advantages of a sound system of banking, we ought not to overlook its influence on the humbler classes of society. Scotland has always bestowed on such classes the good effects of the savings' banks. The poor had always a place of safety in which they could deposit the fruits of their labour. And thus habits of industry, of prudence, and of forethought, were produced and maintained.

In England the poor had no place in which they could deposit their earnings, previous to the establishment of savings' banks; and besides this, they often suffered from the failure of the private banks

The most weighty argument advanced, in the year 1826, for the abolition of small notes was, that they circulated chiefly among the poorer classes; and the banks failed so frequently, as to produce great misery among the inhabitants of cottages. As the legislature despaired of improving the banks, they had recourse to the expedient of abolishing the notes.

If we wish to improve the character and condition of the poor, one of the most effective instruments we can employ, is a sound system of banking. And when we consider not only the numerous classes that have been reduced from wealth to poverty, but also the evil effects produced, and the good effects prevented, on the labouring population, by the system of private banking, we shall perhaps be induced to believe that the clause in the Bank Charter of 1708, which prohibited the formation of banking companies having more than six partners, has been more injurious to the country than any war, famine, or pestilence, with which the land has ever been scourged.

3. *Cash Credits.*—A Banker is a dealer in money; he borrows of one party, and lends to another; he thus draws into active operation those small sums, which were previously unproductive in the hands of private individuals, and furnishes accommodation to those who have need of additional capital to carry on their operations. These advances are usually made in commercial towns by the discounting of bills. But in agricultural districts no bills exist. Hence the bankers, in the country parts of England, made advances to farmers and landlords upon the security of deeds. The banks of Scotland adopted a different mode, and invented cash credits. At the same time, they granted these credits only to such parties as had the means of circulating bank-notes; and as small credits could circulate more notes in proportion to their amount, than large ones, the credits were usually confined to from 200*l.* to 500*l.*

A cash credit is, in fact, the same thing as an overdrawn current account, except that in a current account the party overdraws on his own individual security, and in the cash credits he finds two securities, who are responsible for him. Another difference is, that he cannot overdraw his current account without permission each time from his banker, whereas the overdrawing of a cash credit account is a regular matter of business—it is, in fact, the very thing for which the cash credit has been granted. As in a current account, the party having a cash credit may pay in or draw out money, within the limits of the credit, as often as he pleases, and is charged interest from day to day on the sum overdrawn. It is obvious that the effect on the currency

is the same in both cases. In the current account, the party pays in money every afternoon, in order to get as much interest as he can from the bank; and in the cash credit, he does the same, in order to pay as little interest as he can to the bank. The result is, that all superfluous notes are daily withdrawn from circulation.

4. *The System of Exchanges.*—All the banks in Scotland exchange their notes twice a week in Edinburgh, and pay the balances by exchequer bills. The Scotch bankers are loud in their praises of the system of exchanges. And justly so. But they are in error in supposing that nothing like it exists in England. Our country banks make their exchanges with each other at stated times, and pay the difference by a draft on London. These operations have the same effect as the exchanges in Scotland, of withdrawing from circulation all the superfluous notes—that is to say, all the notes that come into the hands of the bankers.

But the system in Scotland is more extended and more uniform. Most of the banks have their head-offices in Edinburgh, or Glasgow, with numerous branches all over Scotland, and hence they are better able to make arrangements for a uniform system of conducting their business, both with reference to the public, and with reference to one another. But in England, our sagacious legislators have thought proper to prohibit our joint stock banks of issue carrying on business in London, or within sixty-five miles. Hence the head offices of these banks are widely distant from each other, and have no business arrangements for their general guidance. In England, a joint stock bank is too often an isolated body, bearing but little good-will towards the other joint stock banks established in the same place, and having no regard for the principles of joint stock banking beyond what refers to its own individual interest. By far the majority of the country joint stock banks employ private banks as their London agents.* Thus, while in their own locality, they claim public confidence upon the ground of being joint stock banks; yet when they have to choose a banker for themselves, they place their funds in the hands of a private bank. It is this want of union and organization among the banks, coupled with the small amount of their paid-up capital, and the appointment in some cases of incompetent persons to be directors and managers, which has retarded the progress of joint stock banking in England.

It is easy to perceive how these different arrangements dovetail into one another. The operations on the current and cash credit accounts bring out into circulation all the notes which the wants of the community require; while the allowing of interest, and the general prevalence of saving habits, bring back to the banks all the notes which are not in active operation; and by the system of exchanges, all the various notes that may be lodged in any one bank, are immediately presented for payment to the respective banks by

* The total number of Joint Stock Banks and Branch Banks in England, Scotland, and Ireland, who employ private bankers as their London agents is nine hundred and sixty-four (say 964), while the number who employ Joint Stock Banks as their London agents is only two hundred and fifty-one (say 251). On the other hand, the number of Private Banks and Branches who employed private bankers as their London agents is 447, while the number who employ Joint Stock Banks as their London agents is only 24.

whom they were issued. For this beautiful system, Scotland is indebted to the sagacity of her bankers. And we shall now shew how admirably it works in all the various changes that take place in her monetary transactions.

III.—*The Laws of the Circulation of Bank Notes in Scotland.*

Annual Variation.—One law of the circulation is, that the amount *varies from year to year;* it is not every year of the same average amount (see Appendix No. VII. and No. VIII.)

In the year 1843, the average circulation was 2,741,841*l.*; in 1854, it was 3,789,214*l.* The fact is indisputable. The causes of this fact will admit of difference of opinion. The amount of money required in any country will depend upon the number and amount of pecuniary transactions; and these must depend upon the quantity of commodities sold, and the payments that are made. Hence generally we may state, that the amount of the circulation will be regulated by the state of commerce and agriculture.

Looking over the return from 1834 to 1855, we may trace a marked correspondence between the circulation and seasons of commercial excitement and depression in Great Britain. At the end of 1836, occurred a commercial panic; the previous excitement had increased the circulation to an average of 3,217,887*l.*, but after the panic, the average, in 1837, was only 3,074,616*l.* At the end of 1839, occurred another panic. The previous excitement had carried the average of the circulation of 1839, to 3,246,980*l.*; but it declined during the first months of 1840, though it recovered by the end of the year. In 1842, and 1843, the circulation was low. The country circulation of England was also low. When, in 1844, Sir Robert Peel wished to fix upon the average circulation of the previous two years, as the maximum of the future circulation, both the private and joint stock banks of England resisted this on the grounds that those two years were years of depression, and a greater amount of notes would be required when trade should revive. In 1844, trade did revive; and in addition to this, the railway speculations came on in the years 1845, and 1846. The effect is seen in the increase of the average circulation of Scotland, in 1845, to 3,307,132*l.*; in 1846, to 3,439,564*l.*; and in 1847, to 3,516,450*l.* But in October, 1847, came another panic—trade was paralysed; and in 1848, and 1849, the circulation fell to 3,162,692*l.*, and 3,134,073*l.* But in 1850, trade was again stimulated by the importations of gold from Australia, and the circulation rose. The average amounts in the years 1850 to 1854 were as follows:—

	£		£
1850.....	3,225,214	1853.....	3,789,214
1851.....	3,242,922	1854.....	4,055,216
1852.....	3,403,949		

We consider it then a law of the currency, in Scotland, that the amount will vary annually, according to the excitements and the depressions in trade.

Variations during the same Year.—A second law of the currency in Scotland is, that the amount during each year is not uniform throughout the year, but varies from month to month (see Appendix

No. VII. and VIII.)* This is obvious to inspection. But if we farther compare the different years with one another, we shall discover a farther law. The lowest amount of the circulation is in March, and the highest in November. The advance, however, between these two points is not uniform; for the highest of the intervening months is May or June,* after which there is a slight reaction, but it increases again until November, and falls off in December. These are statistical facts, and the uniform occurrence during successive years, shows the existence of a law. The causes of these facts cannot so easily be deduced from the tables, but must be gathered from testimony. From the evidence of the Scotch bankers, before the Parliamentary Committee of 1826, we learn that the cause of the great increase of notes in May and November is, that these are the seasons for making payments. The interest due on mortgages is then settled; annuities are then paid; the country people usually take their interest on their deposit receipts; and the servants receive their wages. There are frequently large sums transferred by way of mortgage. It is the custom of Scotland to settle all transactions, large as well as small, by bank notes—not by cheques on bankers as in London. It will be observed, by Appendix No. VII., that these monthly variations occur uniformly every year; while the amounts of the circulation in the corresponding month of different years, undergo comparatively but little change. The Law of 1845 has made no change in this respect (see Appendix No. VIII.)

Variations in amount of Notes for large and small Sums.—A third law of the circulation in Scotland is, that the amount of notes in circulation under 5*l.* is greater than the amount of notes of 5*l.* and upwards. (See Appendix No. IX.)

The Bank of Scotland first issued notes of 1*l.* in the year 1704; and from that time to the present, they have never been prohibited. In the year 1765, a practice prevailed in Scotland of issuing notes of a less sum than 1*l.*, and which were made payable to the bearer on demand, or payable at the option of the issuer at the end of six months, with legal interest from the demand to that time. By an Act passed in that year, all notes under 1*l.*, and all notes having this optional clause, were prohibited.

In the "Gentleman's Magazine," for 1765, there is a description of one of these notes; it is for one shilling Scots, which is equal to one penny English. It is drawn after the following form:—

Sh 1 Scots. No. Edinburgh.

The *Mason Borrowmen Company* oblige themselves to pay to Solomon Hod, or bearer, *One Shilling Scots* on demand, or at the option of the Directors, one shilling Scots, with the legal interest at the end of *six months* after the day of demand; and for ascertaining the demand, and the option of the *Directors*, the accountant with one of the tellers of the company are hereby ordered to sign, the day of presenting this *Note*, on the back of the same.

By Order of the Court of Directors. W. J., *Accountant.* G. O., *Teller.*

* Since 1844 the returns have been made, not every month, but every *four* weeks. Hence we should notice the dates of the returns: for example—a return for the four weeks ending December 1st, 1849, is properly the return for November.

After the panic of 1825, it was proposed by the Government to abolish all notes under 5*l.* in Scotland, as well as in England; Committees of both Houses of Parliament were appointed to report upon the subject. The evidence laid before these Committees, and probably also the letters of Sir Walter Scott, published under the name of "Malachi Malagrowther," had the effect of causing the measure to be postponed. The following is an extract from the evidence of Mr. Robert Paul, the secretary of the Commercial Bank of Scotland, as to the effect of the abolition of small notes:—

"We should diminish the number of our branches, because we should be involved in an expense, in the transmission of gold, which the profits arising out of our branches could never compensate.

"We should withdraw our cash accounts, because they could no longer accomplish the end for which they are granted—which was, the maintaining our circulation, especially of our small notes.

"We should diminish the interest of our deposit accounts, because we should then be required to keep a very large amount of dead stock of gold in our coffers, to meet the constant variations that would arise, and to keep it wholly unproductive."

The greater amount of small notes arises from the greater number of small transactions. This is no proof of the poverty of Scotland, but on the contrary of the general diffusion of wealth.

We observed last year at Liverpool:—* "If we look to the present state of the circulation in Ireland and Scotland, we shall find that the small notes form the larger proportion, and the amount furnishes no confirmation of the doctrine, that small notes diminish in wealthy countries. Scotland is a wealthier country than Ireland, yet has a larger proportion of small notes. And the north of Ireland is wealthier than the south, yet the banks of Belfast have a larger proportion of small notes than the banks of the south."

When large masses of the population are in extreme poverty, a one pound note is a luxury they never reach. But where a large small-note circulation exists in a country, and is maintained from year to year, it shews that the main body of the people are in that comfortable condition which requires the use of bank notes.

A fourth law of the circulation in Scotland is, that in the comparatively poor and thinly peopled districts the proportion of small notes circulated, is greater than in districts more wealthy, and more densely peopled. (See Appendix No. X.)

Our evidence on this point is not so ample as it would be if every district in Scotland had a local bank. The banks of Edinburgh and Glasgow have branches opened in various districts; and as we have no returns of the circulation of each branch, we cannot tell the proportion of large and small notes that circulate in any one district. Out of Edinburgh and Glasgow there are local banks at Perth, Dundee, Aberdeen, and Inverness. And we find that these local banks circulate a larger amount of small notes, in proportion to the whole circulation, than is circulated by the other banks. We also find that the Western Bank of Scotland, which has a great number of branches established in thinly peopled districts, circulates a large

* Paper on the "Laws of the Currency in England," read before the Statistical Section of the British Association.—*Statistical Journal*, vol xvii., p. 289.

proportion of small notes. Generally speaking, the banks that have the greatest number of branches, circulate the largest proportion of small notes. And this establishes our law; for where the branches are numerous, some, if not many of them, must be established in the rural districts.

The following extracts, from a Bank Agent in Inverary, which was laid before the Parliamentary Committee of the year 1826, bears evidence to the same law:—

"Our produce chiefly consists of cattle and sheep, grain, wood, kelp, and the production of the fisheries. Cattle are brought to the country markets by the breeders, chiefly small farmers, every man attending his own, and having generally from one to three young animals for sale. There they are met by the dealers and graziers, who purchase such of the beasts as suit them; and it is seldom that a single animal at the age of one or two years, being the ages at which they sell them to the dealers and graziers, comes to the price of 5*l.*, the price is more frequently from 2*l.* to 4*l.* Of these, a dealer often purchases two or three hundred in single beasts; so that he has more than 1*l.* and less than 5*l.* to pay to each of as many sellers; but he has no notes under 5*l.*, and the sellers are not able to return balance in any coin. This will occur to many dealers at every market; and how is the difficulty to be removed?

"It is the same in the case of grain, of which bear, or barley, is what is chiefly sold by small farmers to the distilleries. In settling for some bolls bought in small quantities of two or three bolls, 5*l.* notes will be found most inconvenient; and the purchasers and manufacturers of wood and bark, and of sea-weed for kelp, who require many hands, and pay off their workers generally once in the month, none of whom will draw so small a sum as 1*l.*, nor so large a sum as 5*l.*, will experience the same difficulty.

"The herring fishery on our coasts employs several thousand men, and is of very great importance. Instances have occurred of herrings being taken in Lochfine alone to the value of 40,000*l.* in one season; and a thousand boats are generally employed there in the fishing. The fishermen, every morning, sell their fish to the curers on shore, receive their money, and set out in quest for more. The value of each boat's fishing for a night sometimes exceeds 5*l.*, but generally is under it; and there are in this fishing station alone a thousand boats to be paid off every morning, of whom most probably two-thirds have to receive less than 5*l.* each.

"In transmitting money from one part of the country to another, the same difficulty will often present itself. Suppose a person in the Western Isles has to pay 19*l.* to one on the continent. At present this may be conveniently done by three notes of 5*l.* and four of 1*l.*, enclosed by post; but when there shall be no 1*l.* notes, the odd 4*l.* must be sent in gold or silver, not conveniently carried in a post letter, and requiring that a person be employed for the purpose, and at some expense."

Fifthly, we may observe, as a law of the circulation in Scotland, that the small notes in circulation do not fluctuate in exact conformity with the fluctuations in the amount of large notes. (See Appendix No. I.)

In a paper we read before the British Association at Belfast, in

the year 1852,* we made the following observation upon the circulation of Ireland:—"Viewing the monthly circulation we observe that the small notes, like the large notes, are at their lowest amount about the month of August, and at their highest amount about January. But we observe also, that from August the small notes increase more rapidly than the large ones, and after January, they decline more rapidly; so that in every year the proportion of small notes in circulation is greater in January than in August. In a table that I have compiled for the purpose it is shown, that the small notes bear a higher proportion to the large notes in the month of January, than in the month of August. Thus, in January, 1846, the small notes were 58·94 per cent. of the circulation; but in August, they were only 54·33 per cent. We may also observe, that those years that have the largest circulation have also the largest proportion of small notes. Thus, in 1846, the respective proportions for January and August, are 58·94 and 54·33; but, in the year 1849, the proportions were only for January 50·72, and for August 44·95 per cent. This is an indication that the reduction of circulation had taken place chiefly in the small notes; and this again shows, that the distress had fallen chiefly on the smaller cultivators of the soil."

It will be seen that the fluctuations in the amount of notes in circulation in Scotland do not correspond with those of Ireland. It will also be seen that there is no corresponding fluctuation in the small notes, as compared with the large notes. In Ireland, when the total circulation is at the highest, the circulation of the small notes is at the highest, and higher in proportion than when the total circulation is lower. It is not so in Scotland. It will be seen by Appendix No. XI., that the highest circulation in the year 1854, was during the four weeks ending June 10th, and November 25th. In these periods the small notes were also high, but not so high in proportion to the large notes, as in the months ending April 15th, and September 30th. The difference between the two countries arises from this.—In Ireland, the increase in the circulation from September to January arises from the harvest; and as the produce is purchased from the farmers in small quantities, the greatest increase is in the small notes. But in Scotland, the increase of the circulation in May and November arises from large payments, such as we have mentioned; and therefore the greatest increase is in large notes. It is not the custom to make these payments by cheques, as in London, but in 100*l.* bank notes.

These are some of the laws of the currency in Scotland. More minute returns, or a more minute acquaintance with the operations of the banks, might possibly discover other laws. But these are sufficient to show that the circulation of notes in Scotland is not regulated, as some have supposed, by the mere caprice of the bankers, but by fixed causes connected with the economical condition of the country.

It must not be supposed that these laws of the currency are peculiar to Scotland. On the contrary, we think they exist more or less in all countries. But in Scotland they are capable of statistical demonstration. They can be more distinctly traced, inasmuch as Scotland has no gold currency; no banks with exclusive privileges;

* Published in the *Journal of the Statistical Society of London*, vol. xv., p. 307.

nor banks of issue whose partners are limited to six. There is no law to restrict the junction of two or more banks of issue. There is no circle drawn around Edinburgh, within which large banks of issue are not allowed to enter; but every bank may issue notes in any part of the land. Her bankers are not dealers in gold or silver bullion: nor have their notes ever been issued with any view to affect the foreign exchanges, or to promote the financial operations of the Government.

IV.—*The Operations affecting the Currency by the Laws of* 1845.

The Act which now regulates the issue of bank notes in Scotland, is 8 & 9 Vict., c. 38, passed in the year 1845.

By this Act the power of issuing notes is confined to those banks that issued notes in the year preceding the first day of May, 1845. And the amount, to which each bank may issue, is not to exceed the average amount of notes it had in circulation during the year ending the 1st of May, 1845; and the amount of gold or silver coin it may at the time have in possession at the head office or principal place of issue, in the proportion that the silver shall not be more than one-fourth the amount of the gold.

This Act was to come into operation on the 6th day of December, 1845. After which day, each banker is to make weekly returns to the Stamp-Office of his notes in circulation, and of the gold and silver coin on hand; and the averages of four weeks are to be published in "The London Gazette," with a certificate from the commissioner as to whether the bank has held the amount of coin required by this Act.

All banks, except the Bank of Scotland, the Royal Bank of Scotland, and the British Linen Company, are required to send to the Stamp Office, between the 1st and 15th days of January, inclusive the names of all their partners, which shall be published by the 1st day of March following, in some newspaper circulating within each town or county respectively, in which the head office or principal place of issue of such bank is situated. Bank of England notes are not to be a legal tender in Scotland.

The issue of bank notes in England is regulated by the Act of 1844. But the provisions of the two Acts differ in several respects.

The Act which limited the circulation of Scotland, provided against its amount becoming reduced by allowing two or more banks to unite, and to issue notes to the amount of their united circulations. Hence if a bank of issue has occasion to wind up its affairs, it will make an arrangement with some other bank of issue, and by making an agreement for some kind of union, it can transfer the amount of its circulation. In England, on the other hand, if any bank of issue not exceeding six, should increase the number of its partners beyond six, it loses its circulation. If any two banks of issue, each not exceeding six partners, should unite so as to increase the number of partners beyond six, both banks would lose their circulation. If any private bank should transfer its business to a joint stock bank, the circulation would be lost. If any joint stock bank should merge its business in another joint stock bank, its circulation would be lost. If any two joint stock banks of issue should unite and form a new bank, the circulation of both banks would be lost.

But the Act of 1845, not only provided for the maintenance of

the circulation of Scotland, it also permitted its extension. Any bank was allowed to increase its issue beyond the certified amount, provided it held in its coffers a sum of gold equal to the amount of the excess. The Act of 1844, prohibited every English bank from issuing beyond the certified amount; and should it do so, for even a single month, it incurred a penalty equal to the amount of the excess.

The Act of 1845, has produced several practical effects in the management of the banks of Scotland. Had not the Act of 1845 been passed, it is probable that new banks of issue would have been formed in Scotland during the speculations of the year 1846; and there might have been great competition between the old and the new banks. There is now among the banks a less spirit of competition than formerly. There are fewer attempts to attract customers by the offer of increased accommodation. There is a less disposition to grant cash credits, and a less anxiety to obtain those accounts that put into circulation a large amount of notes. Some advances too have been made upon banking charges. The banks have attempted to reimburse themselves for the increased expense of keeping gold, by charging a commission upon the amount of the cash credits and upon payments made in London. Thus confirming the doctrine—a doctrine that statesmen are slow to learn—that restrictions upon banks are taxes on the public.

It may be asked, What is the reason that, since the year 1844, the circulation of Scotland has almost uniformly advanced, while that of the private and joint stock banks of England has uniformly declined?

In our paper on the Laws of the Currency in England,* read last year before the Statistical Section at Liverpool, we stated what we considered to be the causes of the decline in the English circulation. But these causes do not apply to Scotland. The banks of Scotland were permitted to issue beyond the certified circulation upon a deposit of gold. The introduction of the penny postage did not reduce their notes, as this was rendered unnecessary by their system of exchange. The banks had no inducement offered to them to withdraw their notes; and they had to maintain no contest with branches of the Bank of England. The banks of Scotland too had large capitals, and were free from the contingencies attached to those English banks which had been called into existence by the iniquitous Act of 1708. To this it may be added, that the deposit system of banking with payments by cheques, has not extended in Scotland as in England, since the Acts of 1844 and 1845.

In operating on his current account, it is not the general practice in Scotland for a customer to draw cheques on the bank for his individual payments, nor to accept bills payable at the bank. If he has to make twenty payments in the course of the day, he will go to the bank in the morning, and draw out in one sum a sufficient amount of notes to make all these payments. On the other hand, if a customer should receive money from twenty different people in the course of the day, he will not receive cheques, as there are none in circulation, but bank notes, which, at the close of the day, he will pay in one sum into the bank. In England, all these receipts and payments would

* *Statistical Journal*, vol. xvii., p. 289.

be made in cheques, each having probably odd shillings and pence. From this cause the trouble and expense to a bank of conducting a current account is much greater in England than in Scotland.

A few years ago an attempt was made to form a bank to be called the Dunedin Bank of Scotland. One of the advantages it held out to the public was the adoption of the English system of drawing cheques for individual payments. The advantages of this system are pointed out in the prospectus (see Appendix No. XII.), and it was proposed to charge the customers of the bank a half-penny or, if necessary, a penny on each cheque. Here we find that the Scotch bankers calculated that the adoption of the English system of drawing cheques might occasion a cost to the bank of one penny a cheque. And yet, a few months ago, it was proposed in Parliament to lay upon these cheques a charge of another penny in the form of a stamp duty. Thanks to the exertions of the London committee of deputies from the joint stock banks, and the good sense of the Chancellor of the Exchequer, the plan was abandoned. (See Appendix No. XIII.)

In addition to these negative causes connected with the circulating notes in Scotland, there have been others of more active operation. Scotland has not only shared largely in the general prosperity of the United Kingdom, but has had local causes of prosperity arising from the immense sums expended, since the year 1845, in the construction of railways, and the great increase in the manufactures and commerce of Glasgow, and its neighbourhood.

The Act of 1845, has not been successful in imparting to the people of Scotland a taste for gold. The bankers are too wise to issue the gold unless when it is demanded; and the public are too wise to make such a demand. Hence when the increase of the currency requires a further importation, the gold is quietly brought from London to Edinburgh, is quietly locked up in the vaults of the bank, and when no longer required, is quietly sent back again. Of course this is a loss to the banks, of interest, and of the expenses of these transmissions. But in this way it is less injurious than if put into circulation. Disastrous for Scotland will be the day when the people shall become inoculated with the love of a gold currency. The effect of such a desire in England is strikingly exhibited in seasons of pressure. When such pressures occur in Scotland, the banks can employ their whole resources to assist their customers and to support public credit. But when they occur in England, the banks have, in the first instance, to take care of themselves. The banks of issue have to find gold to meet their notes, and at a time too when the gold is leaving the country, and causing a corresponding contraction of Bank of England notes. (See Appendix No. XIV.)

We may observe in conclusion, that the laws of the currency in Scotland, to which we have invited the attention of the Section, have not been enacted by the legislature. From 1765 to 1825, a period of sixty years, no Act of Parliament was passed for the regulation of the issue of bank notes in Scotland. And the Act of 1765 was merely to prohibit notes under 5*l*. And were an English statesmen now to put to the Scotch bankers the question, once addressed by a minister of commerce to a body of French merchants,—"What can I do to serve you?" they would probably make the same reply—"The greatest service you can render us, is to let us alone."

APPENDIX.

The following table, which I constructed from the Parliamentary Evidence of 1826, contains an account of the number of the banks in Scotland, the name of the firm or bank, date of its establishment, place of the head office, number of branches, and the number of partners.

No. I.

Names of Banks or Firms.	Date.	Head Office.	Number of Branches.	Number of Partners
1. Bank of Scotland	1695	Edinburgh	16	Chart.
2. Royal Bank of Scotland	1727	Ditto	1	Ditto
3. British Linen Company	1746	Ditto	27	Ditto
4. Aberdeen Banking Company	1767	Aberdeen	6	80
5. Aberdeen Town and Country Bank	1825	Ditto	4	446
6. Arbroath Banking Company	1825	Arbroath	2	112
7. Carrick and Co., or Ship Bank	1749	Glasgow	None	3
8. Commercial Banking Company of Scotland	1810	Edinburgh	31	521
9. Commercial Banking Company	1778	Aberdeen	None	15
10. Dundee Banking Company	1777	Dundee	None	61
11. Dundee New Bank	1802	Ditto	1	6
12. Dundee Commercial Bank	1825	Ditto	None	202
13. Dundee Union Bank	1809	Ditto	4	85
14. Exchange and Deposit Bank	....	Edinburgh	....	1
15. Falkirk Banking Company	1787	Falkirk	1	5
16. Fife Banking Company	1802	Cupar, Fife	....	39
17. Greenock Banking Company	1785	Greenock	3	14
18. Glasgow Banking Company	1809	Glasgow	1	19
19. Hunters and Co.	1773	Ayr	3	8
20. Leith Banking Company	1792	Leith	4	15
21. National Bank of Scotland	1825	Edinburgh	8	1,238
22. Montrose Bank	1814	Montrose	2	97
23. Paisley Banking Company	1783	Paisley	4	6
24. Paisley Union Bank	1788	Ditto	3	4
25. Perth Banking Company	1766	Perth	5	147
26. Perth Union Bank	1810	Ditto	....	69
27. Ramsays, Bonars, and Company	1738	Edinburgh	None	8
28. Renfrewshire Banking Company	1802	Greenock	5	6
29. Shetland Bank	....	Lerwick	....	4
30. Sir William Forbes and Co.	....	Edinburgh	....	7
31. Stirling Banking Company	1777	Stirling	2	7
32. Thistle Bank	1761	Glasgow		6

Of these 32 banks only 8 remain. These are Nos. 1, 2, 3, 5, 8, 10, 21, and 25.

Private Banking Companies, in the Year 1826, *who did not Issue Notes.*

Name of Firm or Banks.	Date.	Head Office.	Number of Branches.	Number of Partners
1. Thomas Kinnair and Sons	1748	Edinburgh	None	....
2. Donald, Smith, and Co.	1773	Ditto	None	....
3. Robert Allen and Son	....	Ditto	None	....
4. Alexander Allan and Co.	1776	Ditto	None	....

Of these only one remains, (No. 4.)

No. II.

The following Banks of Issue have been formed since 1826, and still remain:—

Name of Bank.	Head Office.	Date.
1. The Union Bank of Scotland	Glasgow	1830
2. The Western Bank of Scotland.....	Ditto	1831
3. The Central Bank of Scotland	Perth	1834
4. The North of Scotland Bank.....	Aberdeen	1836
5. The Clydesdale Bank.....	Glasgow	1838
6. The Eastern Bank of Scotland	Dundee	1838
7. The Edinburgh and Glasgow Bank	Edinburgh	1838
8. The Caledonian Bank	Inverness	1839
9. The City of Glasgow Bank	Glasgow	1839

Three other banks have also been formed since 1826, but they have since merged into other establishments. These are—

1. The Ayrshire Bank, at Ayr, 1831, merged in the Western Bank of Scotland.
2. The Southern Bank of Scotland, at Dumfries, 1838, merged in the Edinburgh and Glasgow Bank.
3. The Glasgow Joint Stock Bank, at Glasgow, 1840, merged in the Edinburgh and Glasgow Bank.

No. III.

The following table exhibits the capital and other particulars of the Banks of Issue in Scotland, with the Price of their Shares, as publicly quoted in December, 1854.

(From the Edinburgh Almanack for 1855.)

Instituted.	Name.	Partners.	Branches.	Paid up Capital.	Dividend.		Share Paid.	Price.	
					Rate.	Payable.			
				£			£	£	s.
1695	Bank of Scotland*	....	31	1,000,000	7	Apr. & Oct.	100	178	10
1727	Royal Bank*	979	9	2,000,000	5	Jan. & July	100	128	0
1746	British Linen Company*.....	578	44	1,000,000	8	June & Dec.	100	205	10
1810	Commercial Bank*	645	53	†600,000	†8	Jan. & July	100	205	0
1825	National Bank of Scotland*....	1,486	42	1,000,000	7	Jan. & July	100	168	15
1829	Union Bank of Scotland	850	56	1,000,000	8	June & Dec.	50	90	0
1838	Edinburgh and Glasgow Bank	1,540	22	1,000,000	4	Feb. & Aug.	5	4	14
1825	Aberdeen Town & County Bk.	484	14	134,575	6	Mar. & Sept.	5	6	17
1836	North of Scotland Bnkg. Co.	1,437	28	191,352	8	May & Nov.	2½	4	12
1763	Dundee Banking Company....	76	1	60,000	5	March	60	85	0
1838	Eastern Bank of Scotland	420	4	121,140	6	May & Nov.	10	10	15
1832	Western Bank of Scotland	1,255	81	1,500,000	8	July & Dec.	50	77	10
1838	Clydesdale Banking Company	1,429	11	807,380	6	Feb. & Aug.	10	12	0
1839	City of Glasgow Bank.....	1,270	43	1,000,000	5½	Feb. & Aug.	10	10	17
1838	Caledonian Banking Company	819	8	125,000	8	August	2½	3	18
1766	Perth Banking Company.....	200	7	100,050	9	July	100	200	0
1834	Central Bank of Scotland	447	8	62,500	8	September	25	50	0
		13,915	462	11,701,997					
	Average.....	818	27	688,352					

* The capital of the banks marked with an asterisk is not in shares, but in stock, transferable any amount. † And a bonus of 2 per cent.

No. IV.

Joint-Stock Banks.

"There is no limitation upon the number of partners of which a banking company may consist, and, excepting in the case of the Bank of Scotland, and the two chartered banks, which have very considerable capitals, the partners of all banking companies are bound jointly and severally, so that each partner is liable to the whole extent of his fortune for the whole debts of the Company.

"The law relating to the establishment of records gives ready means of procuring information with respect to the real and heritable estate of which any person in Scotland may be possessed. No purchase of an estate in that country is secure until the seisine (that is, the instrument certifying that actual delivery has been given,) is put on record; nor is any mortgage effectual until the deed is in like manner recorded.

"In the case of conflicting pecuniary claims upon real property, the preference is not regulated by the date of the transaction, but by the date of its record. These records are accessible to all persons; and thus the public can, with ease, ascertain the effective means which a banking company possesses of discharging its obligations, and the partners in that company are enabled to determine, with tolerable accuracy, the degree of risk and responsibility to which the private property of each is exposed."*

No. V.

A Statement of the Amount of the Paid-up Capitals and of the Deposits in the Joint-Stock Banks of London, and the Proportion Per Cent. which the Capitals bear to the Deposits.

		Paid-up Capital.	Deposits.	Proportion per Cent. of Capital to Deposits.
		£	£	
London and Westminster Bank	30th June, 1855	1,000,000	8,166,553	12¼
London Joint Stock Bank	,,	600,000	6,534,238	9
Union Bank of London	,,	600,000	8,363,460	7
Commercial Bank	,,	300,000	1,317,554	22¾
Royal British Bank	,,	100,000	982,382	10
		2,600,000	25,364,187	10¼
London and County Bank		466,332	4,012,223	11½
		3,066,332	29,376,410	10¼

* Report of the Committee of the House of Commons appointed in 1826 to consider the expediency of abolishing all notes under 5*l*.

No. VI.

Paid-up Capital.

"Two great errors appear to have been committed in the formation of Joint Stock Banks in England, and until these are remedied such establishments can hardly expect to reach a higher degree of importance or credit than is attainable by a wealthy private bank. These evils, are, in the first place, too small a capital relatively to the extent of business undertaken; and, in the next place, the circumstance of the issues of Joint Stock Banks being left uncontrolled by any effective system of exchange.

"The advantage of a small capital in banking is, that it enables the establishment, if at all successful in business, to pay a large dividend. The profits of banking depend, in a great measure, on the amount of deposits and circulation, and according as these are great or small, compared with the extent of the capital, will the company be enabled to divide a larger or smaller dividend. It therefore becomes the obvious policy of those establishments, the managers of which conceive that the success of a bank is proved by the early payment of a high dividend to keep the capital of the company within the narrowest possible limits.

"This system has been carried to the utmost extreme in England, and hence, although large dividends have been paid to the shareholders, there has been no corresponding increase of confidence on the part of the public.

"The Scotch Banks, on the other hand, have pursued a directly opposite course. Their object has been to secure public confidence by the extent of their capital, and they have continued to pay moderate dividends to their shareholders, until justified in augmenting them by years of success, and a large accumulated sinking-fund. So well, indeed, is this system understood, and so completely has it attained its purposes, that the slightest appearance of improvidence displayed by a Scotch Joint Stock Bank, in fixing the amount of its dividend, has been invariably attended with a decrease of the public confidence in the stock of the establishment. In this manner public confidence has been secured, the value of Scotch bank stock has risen in the market, and the shareholders have received their extra profits as a *bonus*, or in the increased value of their own shares.

"Thus, instead of being looked upon as establishments aiming at the ephemeral advantage of making a large dividend, for stock-jobbing or temporary purposes, our banks have almost invariably assumed the character of permanent national establishments, identified with the prosperity of the country, and, by means of their small note circulation, conferring benefit on, as well as obtaining the confidence of, every class in the community."—*Letter to J. W. Gilbart, Esq., on the Relative Merits of the English and Scotch Banking Systems, by* Robert Bell.

No. VII.

A Statement of the Average Circulation of Notes in Scotland for each month during the Years 1834 *to* 1843, *both inclusive.*

	1834.	1835.	1836.	1837.	1838.	1839.	1840.
	£	£	£	£	£	£	£
January	3,004,983	3,056,828	3,091,510	3,149,321	3,000,288	3,244,603	3,076,585
February	2,967,966	2,993,431	3,005,626	3,074,541	2,902,077	3,141,885	2,968,874
March	2,836,574	2,856,666	2,947,446	2,931,429	2,820,476	3,024,427	2,764,692
April	2,836,380	2,873,359	3,054,217	2,863,924	2,931,650	3,058,398	2,954,434
May	3,234,589	3,223,135	3,409,317	3,280,145	2,343,172	3,397,019	3,496,980
June	3,246,732	3,219,757	3,244,996	3,042,897	3,409,068	3,419,953	3,428,401
July	3,108,239	3,058,053	3,230,066	2,977,539	3,121,882	3,165,761	3,228,595
August	3,092,314	3,040,368	3,220,573	2,937,273	3,138,352	3,155,406	3,203,706
September	3,133,644	3,037,925	3,204,376	2,957,730	3,112,289	3,124,807	3,248,968
October	3,234,571	3,134,993	3,350,968	3,110,527	3,310,173	3,290,263	3,384,885
November	3,448,307	3,412,085	3,649,481	3,460,518	3,628,131	3,590,514	3,736,074
December	3,262,101	3,267,691	3,206,068	3,107,554	3,637,215	3,350,724	3,516,534
Total	37,406,400	37,174,291	38,614,644	36,893,398	37,354,773	38,963,760	39,008,728
Average	3,117,200	3,097,857	3,217,887	3,074,449	3,112,898	3,246,980	3,250,727

1841.		1842.		1843.	
	£		£		£
January	3,174,555	February 5th	2,922,882	February 4th	2,629,691
February	3,035,892	March 5th	2,811,109	March 4th	2,588,370
March	2,944,300	April 2nd	2,670,290	April 1st	2,457,604
April	3,024,660	„ 30th	2,590,715	„ 29th	2,487,311
May	3,406,986	May 28th	2,951,383	May 27th	2,843,162
June	3,374,341	June 25th	2,887,038	June 24th	2,869,863
July 24th	3,181,594	July 23rd	2,715,680	July 22nd	2,665,326
August 21st	3,074,393	August 20th	2,674,835	August 19th	2,667,378
September 18th	2,092,549	September 17th	2,648,549	September 16th	2,659,176
October 10th	3,202,703	October 15th	2,743,795	October 14th	2,762,353
November 13th	3,383,036	November 12th	2,891,865	November 11th	2,945,030
December 11th	3,448,660	December 10th	3,091,228	December 9th	3,166,920
1842.		1843.		1844.	
January 8th	3,070,075	January 7th	2,770,838	January 6th	2,901,746
Total	41,414,744	Total	36,370,207	Total	35,643,930
Average	3,185,750	Average	2,797,708	Average	2,741,841

No. VIII.

A Statement of the Average Circulation of Notes in Scotland for each of the Four Weeks during the Years 1844 *to* 1854, *both inclusive.*

1844.	Amount.	1845.	Amount.	1846.	Amount.	1847.	Amount.	1848.	Amount.
	£		£		£		£		£
February 3rd.....	2,791,403	February 1st.....	3,070,058	January 31st.....	3,182,225	January 30th.....	3,700,731	January 29th.....	3,151,022
March 2nd ...	2,684,191	March 1st.....	2,986,708	February 28th.....	3,083,792	February 27th.....	3,503,300	February 26th.....	3,034,367
„ 30th.....	2,610,712	„ 29th.....	2,950,870	March 28th.....	3,018,771	March 27th.....	3,360,348	March 25th.....	2,951,937
April 27th.....	2,714,627	April 26th.....	3,001,240	April 25th.....	3,096,317	April 24th.....	3,395,524	April 22nd ...	2,934,171
May 25th.....	3,041,079	May 24th.....	3,357,251	May 23rd.....	3,401,382	May 22nd ...	3,516,944	May 20th.....	3,152,319
June 22nd ...	3,117,988	June 21st.....	3,485,531	June 20th.....	3,508,655	June 19th.....	3,647,314	June 17th.....	3,437,587
July 20th.....	2,903,322	July 19th.....	3,333,906	July 18th.....	3,390,060	July 17th.....	3,495,921	July 15th.....	3,106,645
August 17th.....	2,894,853	August 16th.....	3,303,255	August 15th.....	3,371,906	August 14th.....	3,455,651	August 12th.....	3,035,903
September 14th.....	2,940,456	September 13th.....	3,341,397	September 12th.....	3,446,787	September 11th.....	3,497,525	September 9th.....	3,021,307
October 12th.....	2,987,665	October 11th.....	3,428,074	October 10th.....	3,665,155	October 9th.....	3,559,976	October 7th.....	3,136,516
November 9th.....	3,284,295	November 8th.....	3,593,988	November 7th.....	3,765,264	November 6th.....	3,606,718	November 4th.....	3,306,273
December 7th.....	3,486,818	December 6th.....	3,804,031	December 5th.....	3,996,861	December 4th.....	3,732,585	December 2nd ...	3,570,126
1845.		1846.		1847.		1848.		„ 30th.....	3,276,826
January 4th.....	3,159,450	January 3rd.....	3,336,409	January 2nd ...	3,787,151	January 1st.....	3,341,317	Total	41,114,999
Total	38,616,859	Total	42,992,718	Total	44,714,326	Total	45,713,854	Average	3,162,692
Average	2,970,528	Average	3,307,132	Average	3,439,564	Average	3,516,450		

1849.	Amount.	1850.	Amount.	1851.	Amount.	1852.	Amount.	1853.	Amount.	1854.	Amount.
	£		£		£		£		£		£
January 27th	3,032,872	January 26th	3,112,859	January 25th	3,252,485	January 24th	3,283,502	January 22nd	3,612,710	January 21st	3,998,126
February 24th	2,952,177	February 23rd	3,054,463	February 22nd	3,138,226	February 21st	3,178,859	February 19th	3,529,986	February 18th	3,974,109
March 24th	2,935,120	March 23rd	2,993,621	March 22nd	3,033,235	March 20th	3,081,769	March 19th	3,443,894	March 18th	3,844,363
April 21st	2,907,915	April 20th	3,014,526	April 19th	3,082,416	April 17th	3,111,970	April 16th	3,492,622	April 15th	3,834,098
May 19th	3,129,189	May 18th	3,194,711	May 17th	3,254,470	May 15th	3,303,002	May 14th	3,687,329	May 13th	3,967,606
June 16th	3,380,902	June 15th	3,471,528	June 14th	3,474,171	June 12th	3,580,302	June 11th	4,026,225	June 10th	4,319,098
July 14th	3,111,724	July 13th	3,238,520	July 12th	3,215,440	July 10th	3,338,295	July 9th	2,761,640	July 8th	4,029,561
August 11th	3,075,970	August 10th	3,172,656	August 9th	3,154,984	August 7th	3,307,750	August 6th	3,746,294	August 5th	3,962,576
September 9th	3,053,322	September 7th	3,173,784	September 6th	3,125,691	September 4th	3,334,198	September 3rd	3,728,890	September 2nd	3,867,441
October 6th	3,139,414	October 5th	3,242,595	October 4th	3,166,005	October 2nd	3,443,061	October 1st	3,843,226	„ 30th	3,970,706
November 3rd	3,281,709	November 2nd	3,318,618	November 1st	3,313,433	„ 30th	3,620,689	„ 29th	3,987,689	October 28th	4,182,128
December 1st	3,500,186	„ 30th	3,594,247	„ 29th	3,590,459	November 27th	3,903,882	November 26th	4,286,486.	November 25th	4,451,908
„ 29th	3,242,448	December 28th	3,345,649	December 27th	3,356,974	December 25th	3,764,064	December 24th	4,112,787	December 23rd	4,316,095
Total	40,742,948	Total	41,927,777	Total	42,157,989	Total	44,251,343	Total	49,259,777	Total	52,717,815
Average ...	3,134,073	Average...	3,225,214	Average...	3,242,922	Average...	3,403,949	Average...	3,789,214	Average ...	4,055,216

No. IX.

The Circulation of the Banks in Scotland, with the Proportion between the Large and Small Notes during the Four Weeks ending June 6th, 1855.

Name of Banks.	Total Circulation.	Notes of £5 and upwards.	Notes under £5.	Proportion Per Cent. of Notes under £5 to the whole Circulation.
	£	£	£	
Bank of Scotland	421,872	143,151	273,721	64·88
Royal Bank of Scotland	208,772	79,435	129,337	61·95
British Linen Company	529,024	205,805	323,219	61·10
Commercial Bank of Scotland	525,560	182,176	343,384	65·34
National Bank of Scotland	358,353	123,725	234,628	65·47
Union Bank of Scotland and Banking Company in Aberdeen	546,705	200,190	346,515	63·38
Edinburgh and Glasgow Bank	170,587	69,725	100,862	59·13
Aberdeen Town and County Bank	124,785	48,419	76,366	61·20
North of Scotland Banking Company	239,311	128,578	110,733	46·27
Dundee Banking Company	45,464	17,861	27,603	60·71
Eastern Bank of Scotland	43,130	18,914	24,216	56·15
Western Bank of Scotland	577,039	185,552	391,487	67·84
Clydesdale Banking Company	166,839	60,273	106,566	63·87
City of Glasgow Bank	221,334	94,901	126,433	57·12
Caledonian Banking Company	77,851	27,360	50,491	64·86
Perth Banking Company	57,331	22,410	34,921	60·91
Central Bank of Scotland	63,738	24,232	39,505	61·98
Totals	4,377,695	1,632,707	2,744,987	62·70

No. X.

Amount of Bank Notes authorized by law to be issued by the several Banks of Issue in Scotland, and the Average Amount of Bank Notes in Circulation and of Coin held during Thirteen Periods of Four Weeks, from November 27th, 1852, to October 29th, 1853; and from November 26th, 1853, to October 28th, 1854—as published in the Gazette.

Names of Banks.	Authorized Circulation.	Average Circulation, 1852–53.	Coin, 1852–53.	Average Circulation, 1853–54.	Coin, 1853–54.
	£	£	£	£	£
Bank of Scotland.....	300,485	369,432	127,006	396,179	155,608
Royal Bank.....	183,000	184,703	48,253	186,749	52,265
British Linen Company	438,024	467,543	133,191	501,663	159,633
Commercial Bank of Scotland.....	374,880	459,926	141,611	500,233	183,925
National Bank of Scotland.....	297,024	308,480	60,716	342,222	85,761
Union Bank of Scotland	415,690	493,311	141,989	519,750	168,380
Edinburgh and Glasgow Bank	136,657	153,762	40,609	158,068	47,694
Aberdeen Town and County Bank.....	70,133	96,844	34,520	107,188	42,318
North of Scotland Banking Company	154,319	175,925	40,477	196,382	58,857
Dundee Banking Company	33,451	34,791	5,417	37,707	7,551
Eastern Bank of Scotland.....	33,636	37,218	7,277	42,514	12,199
Western Bank of Scotland.....	337,938	501,765	220,458	526,632	272,780
Clydesdale Banking Company	104,028	126,559	43,992	140,819	68,908
City of Glasgow Bank	72,921	160,316	99,576	178,635	119,796
Caledonian Banking Company	53,434	66,586	23,745	74,552	31,948
Perth Banking Company	38,656	43,520	13,159	49,187	18,037
Central Bank of Scotland	42,933	52,314	16,021	58,680	22,360
	3,087,209	3,732,995	1,198,017	4,026,160	1,508,020
Average	181,600	219,587	70,471	236,832	88,707

No. XI.

A Table showing the Proportion between the Small and the Large Notes in Circulation in Scotland in each Month during the Year 1854.

1854. The Four Weeks ending	Total Circulation.	£5 and upwards.	Under £5.	Proportion Per Cent. of Notes under £5 to the whole Circulation.
	£	£	£	
January 21st	3,998,126	1,345,312	2,652,812	66·35
February 18th	3,974,109	1,405,994	2,568,114	64·62
March 18th	3,844,363	1,350,554	2,493,804	64·87
April 15th	3,834,098	1,314,003	2,520,091	65·73
May 13th	3,967,606	1,398,615	2,568,986	64·75
June 10th	4,319,098	1,530,290	2,788,804	64·57
July 8th	4,029,561	1,408,582	2,612,272	64·83
August 5th	3,962,576	1,384,162	2,578,413	65·07
September 2nd	3,867,441	1,304,628	2,562,808	66·27
September 30th	3,970,706	1,322,002	2,648,696	66·71
October 28th	4,182,128	1,454,939	2,727,185	65·21
November 25th	4,451,908	1,543,601	2,908,304	65·33
December 23rd	4,316,095	1,522,168	2,793,922	64·73

No. XII.

The Dunedin Bank (*Payments by Cheques*).

"Were the principle adopted in its full extent, the bank would, in reality, become general cashier for their customers; and the necessity of having money in hand, for the purpose of meeting every-day expenses, would be, in a great measure, superseded. A larger portion of funds would be consequently in deposit bearing interest, and, at the same time, as ready for use, as if in the coffer or pocket-book of its owner. By this means, likewise, a regular journal of receipt and expenditure would be carried on without the slightest trouble on the part of the individual concerned, who, at the end of the year, or of the periodical balancing of accounts, would find an authentic record of his ordinary transactions. Here, too, he would find the vouchers for the payments he had made, and would be under no apprehension of being called upon, in repetition of payment, through any loss of his receipts.

"As much inconvenience and trouble will be necessarily incurred

by the adoption of this plan, it is proposed to meet the additional expense by a small tax upon the transactions themselves; and it is calculated that the trifling commission of a halfpenny upon each single payment or entry, 4*s.* 2*d.* upon the hundred, will afford sufficient remuneration for the increase of labour. Should the fee be found too small to remunerate, or to guard sufficiently against the abuse of the privilege, it will of course be easy for the bank to increase the charge—say, to one penny, or more, on each transaction."

No. XIII.

Stamps on Bankers' Cheques.

At a meeting of the London Committee of Deputies from the Joint Stock Banks of England, Wales, and Ireland, held at the London Tavern, on Friday the 27th April, 1855, the following resolutions were adopted:—

1. "That the deposit system of banking, which enables individuals to place money in banks, and to make all their payments by cheques, is beneficial to the depositors themselves, to the banks, and to the community at large.

2. "That the introduction of joint-stock banks has greatly extended this system, and brought its advantages within the reach of the less wealthy classes of society.

3. "That the efficiency of this system would be greatly impaired, and its progress arrested, by the imposition of a tax of one penny upon each cheque. The inducement to open banking accounts will be done away with; the public will be driven to the use of notes and coin, and become their own bankers; money will be thus hoarded; and the country will be thrown back upon a system which prevailed a century ago, without any commensurate advantage to the revenue.

4. "That the tax, being equal upon cheques of all amounts, will proportionably press most severely upon those depositors who draw cheques for small sums; and these classes, having most occasion to regard small savings, will be the most likely to close their accounts.

5. "That, in proportion as this tax shall cause money to be withdrawn or withheld from the banks, in such proportion will capital be rendered unproductive, individuals will be inconvenienced, pecuniary transactions will be obstructed, robberies will be facilitated, and demands created for additional currency, either in bank-notes or gold, while the banks will find their operations materially restricted, and their means curtailed of affording facilities to commerce, or of sustaining the financial operations of the government.

6. "That, therefore, in the opinion of this Committee, the imposition of the proposed tax ought to he strenuously resisted, both by the banking interest and the public; and that a copy of these resolutions be respectfully transmitted to the Right Honourable the Chancellor of the Exchequer, and forwarded to every joint-stock bank in the United Kingdom."

No. XIV.

A Gold Currency.

"Nor are these benefits, great as they are, the only advantages which we have derived from our system of banking. Our one-pound notes connect and familiarize every artizan and labourer in the country with our banking establishments; and the implicit confidence in our paper currency thus created, and perpetuated by the general experience of the sufficiency of our banks, has on many occasions been remarkably illustrated. It is no exaggeration to say, that, at this moment, nine-tenths of the labouring classes of Scotland, if they had their choice, would prefer a one-pound note to a sovereign; and, as a consequence of this feeling of security, combined with a sense of the other advantages of the system, no one in Scotland can have forgotten the truly national stand, on behalf of our currency, which was made by rich and poor in the year 1825, when your English economists proposed to visit us with an injury similar to that which was in that year inflicted on England.

"With banking establishments thus pre-eminently possessed of national confidence, no mercantile convulsion has hitherto created any general run on our great joint-stock banks. It has been otherwise in England, where, in consequence of legislative enactments, the public have been taught to regard *gold* and *silver* as the only representatives of value. The bond of union between the banks and the mass of the people has thus been severed; and when a monetary crisis occurs, its consequences are incalculably more injurious. With us (though very rarely) runs have been made occasionally on particular banks; but it has been merely to withdraw a deposit from one bank to place it in another, or to exchange the notes of a suspected bank for the *notes* of one of our national joint-stock banks, the prevailing confidence in our paper currency remaining unshaken. In this way the disposable banking capital or resources remain in the aggregate unchanged; whereas, with you, the run is for gold; and the coin thus withdrawn from one bank is not redeposited in another, but hoarded till the panic is over, by which means the entire banking resources of the country are involved in the consequences of the temporary disasters, and this, too, at the very time when these resources are most needed."—*Letter to J. W. Gilbart, by* Robert Bell.

The Influence of Factory Life on the Health of the Operative, as founded npon the Medical Statistics of this Class at Belfast. By A. G. Malcolm, M.D.

[Read before the Statistical Section of the British Association at Glasgow, September, 1855.]

The great importance of the linen manufacture as the chief item in Irish prosperity, is a fact admitted by all. It is remarkable that but thirty years ago, this branch of trade was almost exclusively a rural occupation. The spinning wheel of the Ulster cottier gave place to the spindle about the year 1828, when the first flax spinning factory was erected by an Englishman in the neighbourhood of Belfast. Since that period, upwards of 25 mills, numbering about 237,000 spindles, and employing above 11,000 persons, have been in operation. Belfast is, therefore, essentially a factory-town. This manufacture has become an established necessity in our present exalted position as the chief business town in Ireland; and the prosperity of the country is now bound up with the progress of this ancient staple manufacture. It is, then, the duty of all who would wish to see Ireland preserve her powers of competition to use every legitimate means to foster this important branch of industry, and to endeavour to remove all impediments to its successful prosecution. Amongst these impediments, there is one which has attained much public prominence since the year 1830; namely, the alleged injurious influence of factory labour when compared with the discarded process of hand-spinning. The change to the use of machinery was forced upon Ireland when she resolved to retain her position in the linen manufacture. This revolution, it was maintained, was attended with enormous evils in a sanitary point of view, and an agitation which shook these countries to their centre was the result. Parliamentary commissions, in addition to innumerable volunteers, probed the evils alleged; and ultimately the Imperial Legislature interfered to limit the hours of labour, and legalized other restrictions upon the free use of factory labour. The Government and the country were alike convinced of the necessity for these stringent measures; and so judiciously have they been carried into operation, that even employers have admitted the utility of their provision.

It is not my intention to touch upon the question of Government interference with free labour. My object is simply to draw attention to the influence of factory life as founded upon medical statistics; to show that there are injurious results to a great extent necessarily due to factory employment, and to lay down some suggestions as recommendations to employers, for reducing the sphere of these influences to the smallest possible compass; and that this may be effected without a corresponding loss of industrial gain, it will be my province to show that the proposed improvements must be attended with positive profit.

In order that my audience may fully comprehend the exact amount and nature of the employment in flax spinning factories, I shall here premise a brief description of the processes through which the flax passes from the rough state to the yarn. It may be as well

to mention also one or two points in reference to the structure of the flax itself. The fibres of the flax, technically *liber fibres*, have been examined both microscopically and chemically, and are found to present peculiar characters.

"The filaments of flax," says Dr. Ure, "have a glassy lustre when viewed by daylight, in a good microscope, and a cylindrical form which is very rarely flattened; their diameter is about the 2000th part of an inch; they break transversely with a smooth surface like a tube of glass cut with a file; they are readily distinguished from cotton by their form and consistence, being round and attenuated to a point at each end, and of a firm woody consistence, which prevents them from collapsing and having pits in their walls." It would be also noticed, by reference to these drawings, that at intervals along the line of fibre there are opaque nodulated spots, presenting in some degree the appearance of joints. The difference between the flax fibre and the cotton down (the hair upon the seed of the cotton plant), and wool, which is but animal hair, is easily and at once determined by microscopical examination. Many chemical analyses of flax straw have been made since one of the earliest by Sir Robert Kane. One of the latest is from the laboratory of my friend, Professor Hodges, of Belfast, which is published in the transactions of the "British Association" for 1852; the result of the analysis will be found at page 276, from which I find the interesting fact, that a large amount (12·8 per cent.) of the ash of the straw is composed of the insoluble and infusible silica, which exists nearly pure in rock crystal, flint, and some kinds of sand, and, as is well known, is the chief ingredient in glass.

The bearing of these facts I shall reserve till after the description of the spinning processes, which I shall now submit. These processes are conducted in large factories by the aid of certain mechanical appliances, moved generally by steam power, and tended by a large staff of workers from ten years of age and upwards. The first process, called hackling, is effected by means of the hackling machine, the object of which is to split and fine the fibre. The kind of machine in ordinary use requires eight boys to attend it, generally the youngest hands in the mill. Their labour consists in screwing on and off the holder tops, about 4lbs. to 5lbs. weight, taking out the flax and placing it in a pile before them. This labour is unremitting, and is all performed standing. Several of these machines are at work in one room, the air of which, though of the ordinary temperature, is so charged with floating flax dust as slightly to obscure the vision. The hackled flax is now carried to the spreader, a machine on which the "stricks" of flax are spread by two girls upon four leather sheets or endless belts, which conduct the flax to two feeding and holding rollers; after passing through these, it is drawn by a pair of drawing rollers in front of the machine as in the cotton process, but with this difference, that in flax preparing machines "gills" are made use of, that is, bars armed with steel pins, which move in an endless chain by means of screws between the holding and drawing rollers. The object of the gills, is to assist in the holding and drawing of the fibre. The hands for this machine are the best paid in the mill, as more skill is required. They never change their place, but stand in

a slightly stooping position, and spread the flax as the sheet slowly revolves. As the flax leaves the "spreader" it resembles a ribbon, and is coiled for convenience in a tall can. Several of these cans are placed behind the next machine, called the drawing frame, and the flax ribbons are doubled and drawn out by it in the same way as in the spreading process. One girl will attend to the cans at the back of three drawing frames, and at the same time to the cans in front. She has to remove the cans as they are filled, and replace them; this work is light and intermittent, and allows of much freedom of movement. The flax ribbon is then passed through the second and third drawing frames in succession, with one girl to three, precisely as before. The ribbon as it leaves the drawing frame, "sliver," as it is called, is next submitted to the roving frame; the object of this machine is to draw the fibres still more, slightly twist and wind them preparatory to the last process. The "sliver" is put to the back of the roving machine in the can, and is thence drawn in as in the drawing frames.

On leaving the drawing rollers it receives a slight twist by the flyer in order to give it tenacity, and is then wound upon bobbins. One girl is employed at the back of the frame with the same duties as at the drawing frame, and another is employed in the front to shift the bobbins when full. The work in this room, which contains all the preparing machines, is light, and allows the girl often to sit; there is little dust, and the temperature is at par.

The flax is now ready for the spinning frame: this machine is provided with troughs filled with water kept heated to about 200° by steam. Through this the rove passes; afterwards through a pair of retaining rollers and a pair of drawing rollers; these draw out and attenuate the rove in its soft state; at the same time a spindle gives it the twist, and winds it upon the bobbin. One girl attends to each frame: her duty is to replace the roving bobbins as they become empty, and to piece the yarn when it breaks. She is assisted by a staff of young workers, called "doffers," eleven or twelve in each room, who, as each frame of bobbins becomes full, take them off, and replace them by empty ones. The room in which this process is conducted is generally very large, containing from fifty frames and upwards. The atmosphere is moist and hot, but free from all dust: the temperature seldom under 90°.

The full bobbins are next taken to the reeling rooms, and then reeled by grown up women on the reel frame. This work is not laborious, and admits of a constant change of position. The reeling-room is generally free from dust, and of an equal, moderate temperature.

In some factories a carding machine is employed for working up the coarser, shorter, and less valuable fibre, the refuse of the hackling process, technically called "tow." This is carded by the machine mentioned, and afterwards passes through the first and second drawing frames, and is then rove and spun precisely as the flax, and with the same number of hands. In the carding process, the tow is spread on endless sheets in front of the machine, by a girl, and then passes all round the card, transferred by rollers from one to the other until it comes out in *sliver*, or ribbon-shaped band, and

is deposited in the cans whence it is removed to the drawing frame. The carding work is constant, while the machine is in motion, and must be performed in a stooping position over the tow, which, in the process, so fills the air with the dust of the fibre, as to prevent clear vision: the temperature in this room is average.

The foregoing brief description is sufficient to show the nature of the injurious influences which are capable of inducing ill health in the operative: to these I shall severally allude, with a view to arrive at *à priori* results, which will prepare us for comparison with those actually ascertained by observation.

1st. *The influence of the Flax and Tow dust.*—All authors on the factory question, concur in ascribing much ill-health, if not actual disease, to the atmosphere of the hackling and carding rooms. In fact, a single visit to these departments, in operation, will convince the most sceptical that the functions of the organs of respiration must be materially and injuriously interfered with—for, of what is this dust composed? I refer now, particularly to the most minute particles, which indeed may be termed microscopic, inasmuch as the grosser portions of the fibre are evidently unable to reach the internal respiratory passages. The minute dust, then, consists, as I have before stated, of pointed, angular, slightly nodulated fibres, armed with minute portions of *silica*. It is self-evident, that if such particles and fibres reach the internal respiratory passages, they must act as foreign bodies, and set up more or less irritation. That they *must* enter the passages aforesaid is undoubted, as the particles spoken of are microscopic in magnitude. Should the operative be but for a limited time exposed to this influence, the irritation set up will right itself by eventual expectoration of the offending substance. But when this influence continues to operate for a lengthened period, it is plain that the irritation must become chronic, and the morbid changes resulting, will sooner or later assume the character of organic disease.

2nd. *The Position of the Worker.*—In all the processes, the chief position of the body is erect; in several, with a stooping inclination. At the drawing and roving frames, the work is intermittent, and permits in some degree of alternate rest. The immediate effects of posture are most marked in the young or growing. We are, accordingly, prepared to hear of complaints referable to the ankle or instep, which in certain constitutions would form a predisposing cause of articular disease. Again, the forward inclination of the body, a posture common to many occupations, has been long ascertained to tend to, if not actually *induce*, thoracic and gastric maladies. A moment's reflection on the constraint produced by this posture in the play of the respiratory and circulatory organs, as also the undue pressure on the abdominal viscera, the result of persistence in this posture, is sufficient to show its capability of interfering injuriously with the vital processes.

3rd. *High Temperature.*—In the spinning rooms, the air is not only very warm, but charged with vapour. The consequence is, that the workers are constantly and sensibly perspiring; and the feet, and a portion of their dress are saturated with the spray from the machinery. But this is not all. We must remember that there is

no change of dress, and that the transition from a high temperature and moist atmosphere, to a comparatively cold and dry one, is instantaneous, as the workers leave the mill three times a day without change of clothes, and with the skin in a high state of over-action. The causes at work here are, accordingly, the high temperature, the wet clothes, and the sudden transition from a heated to a cool atmosphere. All of these influences must bear more or less injuriously upon the respiratory organs. We are hence prepared to meet with *catarrhs*, *thoracic inflammations*, and even *pulmonary consumption*. It is true, as I have heard frequently remarked, that "the cold" which may be contracted from the transition referred to, has been actually cured by the return of the worker to the spinning-rooms; but it is evident, that what is capable of producing one attack, if repeatedly renewed, must in the end predispose to, if not, *per se*, induce actual disease. The violent stimulation of the skin which a high temperature produces, has also other effects. The circulation is rendered more active; and if there should be, as frequently does exist, a delicacy in any organ which may not have yet become developed into disease, there can be no question that the circumstances favourable to its developement are here supplied. The high temperature is also unfavourable to the due action of the digestive organs. During digestion, the stomach in particular requires a large share of nervous energy exclusively for itself; if, therefore, the nervous energy be diverted to other purposes, as for example—to counteract the stimulating effect of a heated atmosphere, it is rational to believe that injury must result.

I have not alluded to the influence of fatigue, though it has been prominently referred to by writers on this question, because the hours of labour are now so reduced, that little or no complaint can be made on the score of over-work. Accordingly, I shall not here adduce it as an *à priori* evil.

I shall now submit the actual results which I have ascertained by statistical inquiry, as to the influence of factory life.

In Belfast, judging from the census returns of 1841 and 1851, and the ratio of increase, there are now about 112,000 inhabitants. Of these, judging from the same returns, about 36,000 belong to the operative class; *i. e.* persons not having the direction of labour. Of this latter number, about 11,000 are factory-workers, which, it will be observed, is a little less than one-third of the entire labouring population. By a calculation, based upon the actual numbers in several of our principal mills, I find that the number of hands in the hackling department, is 1899; in the preparing department, 1210; in the spinning department, 4351; in the reeling department, 2194; mechanics and bundlers, 1045; mechanics at odd work, 888. These figures show that we have a sufficiently extensive means of arriving at fair conclusions regarding the average amount of health, and tendency to disease, amongst this particular class. Upon this broad basis, I have arranged three systems of tabular returns, viz.:—

1. I examined 2078 female workers, by means of certain queries, indicating the particular employment, the age, the time at mill-work, the condition of health, and, as far as could be ascertained, the medical history, including the number of times laid up on account

of ill-health, the duration of past serious illnesses, and, as far as possible, the nature of the illnesses themselves. 2. I collected our general hospital returns, for some ten years past, in order to ascertain the relative number of factory workers, and the diseases for which they were admitted into hospital. 3. I collected similar returns from the registers of the six dispensary districts into which Belfast is divided, and ascertained in like manner the diseases for which they were treated. In addition to my own experience in my public appointment, which have for several years past furnished me with abundant opportunities, I personally inspected the workers at the factories, with a view to gain a general idea of their health status. The results of these different kinds of evidence I afterwards compared with the returns of disease amongst the entire population for whom medical relief has been provided by hospitals and dispensaries, *i. e.* amongst that section of society of which the factory operatives form a part.

1. The 2078 workers, to whom the queries were submitted, were indiscriminately visited at their homes, which were situated in various parts of the town, where, in fact, mill-workers mostly congregate. I found their ages to give the following result:—

Under 20	1,226 or 59·0	per cent.
From 20 to 30	745 or 35·8	,,
From 30 to 40	89 or 4·2	,,
Above 40	18 or 0·9	,,

Their particular departments of occupation I found to be as follows:—

Preparers	262 or 12·6	per cent.
Spinners	1,281 or 61·6	,,
Reelers	457 or 22·0	,,
Weavers	78 or 3·7	,,

The time during which they had been occupied at mill-work, is indicated by the following table:—

Under 1 year	333 or 16·0	per cent.
Above 1 and under 5 years	1,035 or 49·8	,,
Above 5 and under 10 years	512 or 24·6	,,
Above 10 years	198 or 9·5	,,

I found the following to represent the general average health;—the number in good health, or not complaining, 1522, or 73·2 per cent.; the number in tolerable health, who complained more or less constantly, 218, or 10·4 per cent. The number decidedly delicate, and requiring medical aid, 338, or 16·2 per cent. The number who admitted having been once laid up, 122; several times, 410; very often, 84; the remainder 1462, denied having ever left the mill in consequence of ill-health. The duration of the time in which workers were laid up on account of ill-health, is shown in the following table:—

For 1 week or under	200	For 1 to 2 months	149
,, 1 to 4 weeks	192	Above 2 months	75

The total number who admitted having been off duty on account of ill-health, was 616, or 29·6 per cent. the amount of disease which they admitted they suffered, and for which they had to leave work, as shown in the following tables:—

Preparers.

Ages—Under 20	132 or 50·4	per cent.
20 to 30	110 or 42·0	,,
30 to 40	15 or 5·7	,,
Above 40	5 or 1·9	,,
Diseases—Of the chest	32 or 12·2	per cent.
Fevers	11·4	,,
Headaches	25 or 9·5	,,
Of the locomotive organs	15 or 5·7	,,
Debility	12 or 4·6	,,
Of the stomach and liver	12 or 4·6	,,
Of the bowels	9 or 3·4	,,
Of the skin	9 or 3·4	,,
Injuries	5 or 1·9	,,

Spinners.

Ages—Under 20	920 or 71·8	per cent.
From 20 to 30	333 or 25·9	,,
From 30 to 40	28 or 2·1	,,
Above 40	None	
Diseases—Headaches	110 or 8·5	per cent.
Fevers	94 or 7·3	,,
Stomach and liver	81 or 6·3	,,
Locomotive organs	72 or 5·6	,,
Chest	53 or 4·1	,,
Debility	43 or 3·3	,,
Nervousness	33 or 2·5	,,
Injuries	22 or 1·7	,,
Bowels	16 or 1·2	,,
Of the skin	8 or 0·6	,,

Reelers.

Ages—Under 20	125 or 27·3	per cent.
20 to 30	276 or 60·9	,,
30 to 40	45 or 9·8	,,
Above 40	11 or 2·0	,,
Diseases—Fevers	48 or 10·5	per cent.
Chest	41 or 0·9	,,
Of the stomach and liver	33 or 7·2	,,
Headaches	30 or 6·5	,,
Debility	27 or 0·6	,,
Bowels	21 or 4·5	,,
Locomotive organs	20 or 4·3	,,
Of the skin	9 or 0·2	,,
Nervousness	8 or 1·7	,,

Weavers.

Ages—Under 20	46 or 59·0	per cent.
20 to 30	31 or 39·7	,,
30 to 40	1 or 1·2	,,
Above 40	None	
Diseases—Fevers	6 or 7·7	per cent.
Headaches	5 or 6·3	,,
Debility	4 or 5·0	,,
Stomach	4 or 5·0	,,
Locomotive organs	2 or 2·5	,,
Chest	1	
Bowels	1	

The foregoing returns cannot be taken without some explanation. They are not intended to show either the actual or relative amount of disease suffered by the 2078 workers examined; but they do indicate the most important and most frequent kinds of ailment which made an impression upon the memory, and they are calculated to show distinctly enough the classes of complaints to which the mill-worker is more particularly subject. No hacklers are included in these returns, as that department is carried on by male hands. We have, then, only to compare the spinners with the "preparers and reelers." Among the spinners we find, as we should expect, headaches, and gastric ailments, and complaints of the extremities predominate. Among the preparers, we find headaches coming third in frequency, locomotive organs fourth, and gastric affections fifth; and among the reelers, gastric affections come third, headaches fourth, and locomotive organs sixth. With regard to thoracic diseases, we find a much smaller proportion than we should expect, amongst the spinners; the elder workers in the other departments having been much more frequently affected.

2. From the 1st of April, 1848, to the 1st of August, 1854, there were admitted into the general hospital 230 male, and 377 female workers, making a total of 607. Of this number, we find the following proportions referable to each class of affections:—

	Males.	Females.	Total.
Injuries	100	94	31·9 per cent.
Of the skin	29	139	22·8 ,,
Of the chest	32	50	13·5 ,,
Phthisis	6	27	5·4 ,,
Locomotive organs	33	38	11·7 ,,
Bowels	10	9	3·1 ,,

Dropsy, Uterine Disease, Nervousness, and Gastric Ailments, each under 2 per cent.

By comparing this set of figures with the returns of all the cases admitted into hospital for a period of several years, we find the following differences:—

Diseases of skin showed an increase of the general average to the amount of 6·3 per cent.
Injuries, 3·2 per cent.
Of the chest, a decrease of 3·6 per cent.
Of Phthisis, an increase of 3 per cent.
Of the locomotive organs, an increase of one-half per cent.
Of Uterine disease, an increase of 3·10 per cent.
Of the bowels, a decrease of 2 per cent.
Of Nervousness, an increase of 3·10 per cent.
Of Gastric affections, a decrease of 5 per cent.
Of Dropsy, a decrease of nearly 2 per cent.

We find accordingly that injuries, diseases of skin, of the locomotive organs, consumption, uterine and nervous diseases are observed in greater proportion amongst the factory workers, while ordinary bronchitis, bowel affection, gastric disease, and dropsy were in a diminished ratio.

It may be well to mention as explanation, that none but the most severe cases have been for a long time admissible into the general hospital, which would account for the very small ratio in

the gastric, nervous, and uterine diseases. As fever cases, except among a paying class, are not admitted at all, I have accordingly not taken them into consideration.

3. The returns which I collected from the six dispensary districts, between the years 1852 and 1855, produced a total of 2503 mill-workers affected by disease; of these, 394 were males, and 2109 females: the proportion of disease is seen in the following table:—

	Per Cent.		Per Cent.
Of the chest	18·783	Of the Locomotive organs	4·983
Gastric ailments	14·816	Injuries	2·009
Skin	13·009	Phthisis	2·116
Bowels	12·005	Nervous affection	1·073
Fevers	11·095	Dropsy	·096
Uterine diseases	9·056	Headache	·009
Syphilis	5·026		

Comparing these results with those drawn from an average of two years, on a base of 35,039 cases of all diseases as they occurred in the dispensary districts, we find the following differences:—

Fever was more among the mill-workers by 3·15 in comparison with the general labouring population.

Syphilis increased by	1·0061 per cent.
Diseases of the chest	6·0093 ,,
Gastric ailments	8·0116 ,,
Uterine diseases	2·0683 ,,
Locomotive organs	1·0633 ,,
Phthisis	1·3116 ,,

On the other hand, disease was *less* amongst the mill-workers, in the following proportions:—

Skin diseases, by	4·05 per cent.	Injuries, by	·06 per cent.
Bowel affections, by	8·64 ,,	Nervous diseases, by	·22 ,,
Dropsical ,, by	·02 ,,		

Of the entire 2,503 workers, I have separated the hacklers, and to these have added those from hospital returns for a number of years, making in all but 65, a number perhaps too small upon which to *base* any result were it not for its conclusiveness.

Thus, of chest diseases we find the high proportion of 30·7 per cent.

Of the skin	,,	,,	15·3 ,,
Of the locomotive organs	,,	,,	15·3 ,,
Of the bowels affection	,,	,,	12·3 ,,
Of Phthisis	,,	,,	3·0 ,,
Syphilis	,,	,,	3·0 ,,

The other affections each under 2 per cent.

The marked preponderance of pulmonary affections, though not of phthisis, evidenced by this table, is a fact of *striking* importance, and realizes the *à priori* impression to which I have already referred.

It will appear, from a careful reflection upon the foregoing results, that although conclusions, as drawn from the different sources, are not uniformly concurrent in every particular, still the weight of evidence is in favour of the existence of a considerable amount of ailment (23 per cent. even of those actually at work), and a marked

proportionate increase in some particular diseases to which the mill-worker seems more especially liable; for instance, pulmonary disease, generally bronchitis, is *par excellence*, the hackler's malady. The young workers in the spinning rooms, complain more particularly of articular affections, the elder, of headaches, debility, dyspepsia, phthisis, uterine and pulmonary diseases. These facts are, then, borne out not merely by what we should expect from the nature of the employment, but also from actual experience. This being so, we shall conclude this paper by pointing out some means which may be calculated to reduce disease to a minimum, and improve the comfort and condition of the operative.

1. I would recommend increased provision for insuring full ventilation of the different apartments. I am quite aware that the factories more recently erected exhibit a great improvement in this important requisite, when compared with the establishments of an earlier date. But though we may notice more spacious rooms, less crowding of the machines, and a better adjustment of the window-sashes, still, with rare exceptions, we do not find that there is any adequate provision for maintaining free interchange of the atmosphere under all circumstances. It is quite common for the operatives themselves to regulate the opening of the sashes, or ventilating panes, agreeably to their own feelings of heat or cold, and without any reference to the real average temperature of the department, or the real amount of air space which should be enjoyed by each. Now I would suggest that means be adopted in every factory to ensure an equal temperature, and the freest change of atmosphere, without being subject to the control or whim of the operative. What the precise plans should be to realize this provision, architects should be in a better position to state; but I may here suggest that, in addition to lofty ceilings and abundance of windows, there should be shafts, horizontal and perforated, traversing the ceilings in different directions, and all communicating with a large fan connected with the driving-wheel, which would act by drawing out the used air and expelling it outside the walls. In some rooms, as the hackling and carding apartments, it would be, perhaps, necessary to supplement this method by providing a perforated floor, communicating with a chamber a few inches in depth, but extending the entire area of the floors. This arrangement would allow of a free in-going current, to compensate for the out-going drain of the used or contaminated air. I am aware that in some establishments this arrangement has been partially carried out. Thus, at Leeds, in the Messrs. Marshall's mill, I noticed the fan applied for the withdrawal of the foul air of the hackling-rooms; but in this instance, the air impregnated with the flax dust, was sucked out by chambers ranged along the floor of the apartment—a method which I cannot think to be so efficacious as the system suggested.

Again, I am of opinion, that some uniform arrangement might be easily made, whereby the opening of the sashes, when required, should be regulated *en masse*, and not, as at present, individually, and at the discretion of the operative, or overseer, whereby draughts and minor currents are produced, injurious to more or fewer of the workers in the line of such currents. I can readily conceive of the

realization of some such mechanical design as would effect the end desired, in connection with, say the rise and fall, of the thermometer.

2. The inhalation of the flax and tow dust, which I have shown to be so pernicious, is still going on in our newest and most improved factories unchecked. Some means to prevent the entrance of the injurious particles into the respiratory passages, is imperatively required. Professor Alison, whose recent indisposition all true friends of science must deeply regret, encouraged the workers in stone to grow moustaches, with a view to effect this object; and were all carders and hacklers of suitable age, such a course might be advantageously adopted, but, unfortunately, the most numerous portion in this department comprise mere boys. Taking up the natural hint, however, there can be no reason for supposing that some artificial respirator or contrivance, to act as the natural appendage, might not be of the highest benefit. In realizing this arrangement, it would be necessary to bear in mind that the freest respiration must be maintained, and that the least impediment in this direction, must be scrupulously guarded against. I am not prepared to say what particular form of material, or kind of adjustment, would be requisite; but most certainly the ordinary respirators in use by pulmonary invalids would be quite ineffectual for the purpose. In the absence of anything like a neutralizing agent, some such contrivance as I have alluded to, seems indispensable to nullify the admitted injurious effects of the flax and tow dust.

3. As to the evils of the spinning department, though a high temperature and a moist atmosphere are indispensable to the carrying on of the manufacture, I am of opinion, something of effectual aid might still be considered an open question. It is well known that the workers leave the mill three times a day in moist clothes and with a perspiring skin, and pass immediately into an atmosphere frequently the very opposite. The transition is sudden, and from its very suddenness must be exceedingly trying to any constitution, and much more so to that of the young female. Again, all the workers in every department, must carry away with them more or less of the refuse, and dust, and dirt necessarily attendant on their employment; and hence is insured an almost constant disregard of that most necessary requisite for the maintenance of health, cleanliness. This is a fact almost universal, as I have myself, hundreds of times, had opportunities of verifying. With a view, then, to mitigate, if not altogether counteract, the injury consequent upon these practices, I would desire to see provision for a change of garments (at least in part), the use of a suitable mill-dress while at work, and the resumption of their usual outer clothing on leaving. During work, the ordinary clothes should be hung up in a dry room heated a little above the out-door temperature. By means such as this, the greatest amount of comfort would be enjoyed by the operative consistent with her employment, and the utmost amount of prevention of injurious consequences adopted. I may here suggest, as an additional advantage, that the work-dresses might be provided with waterproof front facings or aprons, to prevent the dresses becoming saturated with the spray from the machinery. And, at the close of the evening work, it would be most desirable if employers would

provide the means of bathing or washing of the body on the premises, so that the workers might be at once prepared to enjoy themselves in suitable recreation, mental or bodily.

And this remark leads me, in closing this paper, to offer a word of entreaty to factory employers, regarding their duty and interest in encouraging, I do not say affording, all proper means of enabling the operative to spend their evenings in a manner calculated to improve their mental condition, and render them more disposed to give freely and fully a good day's work for a fair day's wages. I allude especially to the encouragement of musical societies, and reading clubs, amongst the workers. I deem such of incalculable advantage, not merely to the operative in refining his tastes, and thereby giving him a counteracting power against the degrading though seductive attractions of vicious habits, but to the employer who receives the benefit with interest in the better fulfilment of the operative's duty, and the greater degree of confidence which becomes established between them. I feel assured that nothing can be nearer the truth, than that such a course as I have hinted at would ensure that willingness and disposition to improve amongst the workers, which the highest wages would singly be insufficient to command. I recommend it with all respect, yet earnestly, knowing that many have found themselves in the responsible position of employers, without being at all impressed with the importance of the good old adage, that "property has its duties, as well as its rights"—without, in fact, being fully aware of the momentous relations which they have thereby established.

MISCELLANEA.

To the Council of the Statistical Society.

My Lords and Gentlemen,

The Registrar-General having advised me to render public a table deduced from his 14th and 15th Annual Report, (1851-2), published this year, and whereof he has favoured me with a copy, I beg to communicate it herewith to your Society.

In the 14th (1851) Report are two companion tables, (Table XII. p. xvi,) and in the 15th (1852), are similar tables (Table XI. p. ix,) showing the per centage of mortality in each sex to the numbers living at that age in various years. Thus, in the year 1838, of 100,000 males / females } then living, aged from 25 to 35, there died { 1064 / 1046.

It occurred to me that if the quotient of these two numbers $\frac{1{\cdot}064}{1{\cdot}046} = 1{\cdot}017$ were tabulated, it would nearly represent the law of mortality between the two sexes, independent of epidemics and other aggravating causes. Thus, if 10 men and 9 women, 20 men and 18 women, 50 men and 45 women, etc., died per 10,000 of the then existing population, the *proportion* of 10 to 9 would still remain unaltered.

These quotients are exhibited in the annexed table (see next page).

Thus, of a population of 100,000 of each sex between 35 and 45 years of age, in the year 1849, there died 978 males to every 1,000 females; in 1851, 1,036 males to 1,000 females, etc.

The last column shows how small are the extreme variations for the period 1838-52, or half a generation.

The table indicates that man is relatively weaker than woman at 0–5 years of age ($2\frac{1}{2}$ mean); this maximum is again apparent at 45–55 (*i. e.* 50); they are nearly equal at 5–10 ($7\frac{1}{2}$), 35–45 (40); and at 25–35 (30), the principal period of reproduction, females are less able to resist death in the proportion of 95 to 100. The general regularity of this *minimum at this age* is a most striking feature of the table: and if the birth-register would indicate the age of the mother, and the rank of the child (as 1st, 2nd, 5th, etc.), we should have a still better elucidation of this fact.

The irregularity in very aged persons, of 95 and upwards, is of no great moment, considering the smallness of the data, the occasional impossibility of accurately knowing the exact age of these time-honoured individuals, &c.

The *general* agreement of the two penultimate columns make me suspect some little misprint in the Registrar's numbers for the ages 25–35, 35–45.

If the report-numbers could be ascertained fer every single year of life we might thence deduce the numbers for every single year of life, and perhaps light on the mathematical law of this portion of vital statistics.

I am, &c.,
S. M. Drach,
(F.R.A. & R.G.S.)

23, Walpole Street, Chelsea,
10*th December*, 1855.

The last column *e. g.* is 1·095 − 1·056 = ·039.

Year.....	1838.	1839.	1840.	1841.	1842.	1843.	1844.	1845.	1846.	1847.	1848.	1849.	1850.	1851.	1852.	Mean. 1838-51.	Mean, 1843-52.	Diff. Max. Minim.
All Ages	1·095	1·089	1·077	1·074	1·068	1·076	1·076	1·079	1·078	1·070	1·075	1·056	1·065	1·072	1·076	1·075	1·072	·039
0— 5	1·164	1·168	1·173	1·168	1·170	1·170	1·187	1·178	1·163	1·158	1·160	1·158	1·167	1·159	1·164	1·167	1·166	·031
5—10	1·007	·967	·973	·993	·974	·995	·994	1·029	1·014	1·020	1·046	1·019	1·005	1·010	1·032	1·003	1·018	·073
10—15	·956	·957	·953	·981	·979	·986	·940	·979	·951	·953	·936	·989	·951	·932	·968	·961	·959	·057
15—25	·997	·966	·959	·963	·943	·985	·946	·936	·987	1·011	·977	·959	·923	·949	·958	·966	·965	·088
25—35	1·017	·979	·963	·971	·923	·947	·934	·945	·979	·938	·941	·923	·890	·943	·939	·949	·938	·124
35—45	1·022	1·005	·998	·992	·981	·993	1·021	1·012	1·024	1·010	1·002	·978	·997	1·036	1·013	·989	1·008	·058
45—55	1·174	1·161	1·146	1·158	1·136	1·160	1·148	1·169	1·155	1·154	1·173	1·132	1·165	1·176	1·199	1·157	1·162	·067
55—65	1·145	1·169	1·111	1·145	1·108	1·117	1·100	1·115	1·124	1·131	1·142	1·089	1·135	1·136	1·155	1·126	1·124	·080
65—75	1·168	1·156	1·135	1·110	1·097	1·119	1·113	1·108	1·098	1·105	1·119	1·098	1·103	1·090	1·101	1·115	1·106	·078
75—85	1·111	1·108	1·070	1·067	1·114	1·081	1·086	1·105	1·092	1·087	1·102	1·083	1·105	1·097	1·075	1·093	1·091	·044
85—95	1·124	1·106	1·065	1·049	1·035	1·040	1·115	1·095	1·061	1·107	1·109	1·069	1·102	1·072	1·031	1·082	1·083	·093
95 and upwds.	1·209	1·080	1·050	1·016	1·084	·979	·969	1·167	·989	1·063	·906	·989	·898	·932	1·068	1·021	·995	·311

PROCEEDINGS OF THE STATISTICAL SOCIETY.

First Ordinary Meeting.—Session 1855-56.

Monday, 19*th November*, 1855.

The Right Hon. The Earl of Harrowby, President, in the Chair.

The following Candidates were elected Fellows of the Society:—

James Brown, Esq. | John Jackson Gosset, Esq.

Mr. Newmarch gave an account of the Proceedings of the Statistical Section of the British Association at its recent Meeting at Glasgow.

The following Paper was read:—

"A Résumé of the Second Session of the International Statistical Congress, held at Paris in September, 1855." By Leone Levi, Esq.

Second Ordinary Meeting.—Session 1855-56.

Monday, 17*th December*, 1855.

Colonel Sykes, V.P., in the Chair.

The following Candidates were elected Fellows of the Society:—

Neil Arnott, Esq., M.D. | William Pare, Esq.
A. H. Bailey, Esq. | J. R. Sowray, Esq.
Hon. H. B. W. Brand, M.P. | John Stott, Esq.
William Dawbarn, Esq. | John Strang Esq., LL.D.
R. M. Milnes, Esq., M.P. | J. W. Weldon, Esq.

J. H. Woolley, Esq.

The following Gentlemen were elected Foreign Hon. Members:—

Dr. F. T. Berg, Member of the Royal Swedish Commission for the Registration of Births, Deaths, and Marriages.

Monsieur Maurice Block, Sons-Chef du Bureau de la Statistique Générale de France.

The following Paper was read:—

"On the Nature and Extent of the Benefits conferred by Hospitals on the Working Classes and the Poor." By W. A. Guy, Esq., M.B.

Third Ordinary Meeting.—Session 1855-56.

Monday, 21*st January*, 1856.

Colonel Sykes, V.P., in the Chair.

The following Candidates were elected Fellows of the Society:—

Sir Ralph Howard, Bart. | Thomas Mackern, Esq.
Donald MacGillivray, Esq. | T. B. Sprague, Esq.

Dr. Bird having taken the Chair, the following Paper was read:—

"On the External Commerce of British India." By Colonel Sykes, F.R.S.

Fourth Ordinary Meeting.—Session 1855-56.

Monday, 18*th February*, 1856.

Colonel Sykes, V.P., in the Chair.

The following Candidates were elected Fellows of the Society:—

Robert Barnes, Esq., M.D. | James Hogg, Esq.
Alexander Gibbon, Esq. | Hon. William Vernon.

Edward Zimmermann, Esq.

The following Paper was read:—

"On the present state of the Mining Industries of the United Kingdom." By Robert Hunt, Esq., F.R.S.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE (DEPT OF MEDICAL STATISTICS)

THE MARRIAGES, BIRTHS, AND DEATHS, REGISTERED IN THE DIVISIONS, COUNTIES, AND DISTRICTS OF ENGLAND.

The Marriages for the Quarter ended December, 1855, and the Births and Deaths for the Quarter ended March, 1856,

AS PUBLISHED BY AUTHORITY OF THE REGISTRAR-GENERAL.

This return comprises the births and deaths registered by 2,196 registrars in all the districts of England during the Winter quarter that ended on March 31st, 1856; and the marriages in 12,168 churches or chapels, about 3,718 registered places of worship unconnected with the Established Church, and 628 superintendent registrars' offices, in the quarter that ended on December 31st, 1855.

The general results of the return are favourable. More than the average number of children were born, and the deaths were much below the average number in the winter quarter that ended on 31st March, 1856: the marriages returned for the last quarter of the year 1855 were below the average number.

MARRIAGES.—47,038 marriages were celebrated, and consequently 94,076 persons were married in the three months that ended on 31st December, 1855. The number of marriages in the first quarter of the year was 29,131, in the last quarter 47,038; but it has always hitherto happened in England that the marriages are most numerous in the Christmas quarter after harvest, and least numerous in the Lent quarter, so that this difference is in accordance with the ordinary state of things. The rate of marriage in the last quarter of the year was slightly below the average, and much below the rates of marriage in the corresponding quarters of the years immediately preceding. The rate of marriage decreased in London and in the manufacturing districts, and the decrease is probably referable partly to the high price of provisions, and partly to the increase of the army and navy, where men do not marry to the same extent as in the civil population.

303,548 persons were married (151,774 men and 151,774 women,) in the year 1855, so that the rate of marriage was as 1,616 persons to every 100,000 of the population living, whereas the average in the ten years 1846-55 was 1,682.

Marriages, Births, and Deaths, returned in the Years 1844-56 *and in the Quarters of those Years.*

YEARS.....	1844	1845	1846	1847	1848	1849	1850	1851	1852	1853	1854	1855	1856
Marriages	132249	143743	145664	135845	138230	141883	152744	154206	158782	164520	159349	151774	...
Births.....	540763	543521	572625	539965	563059	578159	593422	615865	624012	612391	634506	635123	...
Deaths	356933	349366	390315	423304	399833	440839	368995	395396	407135	421097	438239	426242	...
	MARRIAGES.												
Quarters ended the last day of													
March.....	26387	29551	31417	27480	28398	28429	30567	32724	32977	35149	33144	29131	...
June	34268	35300	37111	35197	34721	35844	39204	38635	40092	40446	40389	38454	...
September	31675	35003	35070	32439	32995	33874	37636	37316	38400	39899	38150	37151	...
December	39919	43889	42066	40729	42116	43736	45337	45531	47313	49026	47666	47038	...
	BIRTHS.												
March.....	143578	143080	145108	146453	139736	153772	144551	157286	161803	161729	160892	166186	169252
June	136941	136853	149450	139072	149760	153693	155865	159073	159031	158697	172420	165250	...
September	130078	132369	138718	127173	140359	135223	146911	150594	151222	147602	154735	154834	...
December	130166	131219	139349	127267	133204	135471	146095	148912	151956	144363	146459	148853	...
	DEATHS.												
March.....	101024	104664	89484	119672	120032	105870	98430	105359	106358	118119	111970	134605	103208
June	85337	89149	90230	106718	99727	102153	92871	99458	100625	107647	102666	106584	...
September	79708	74872	101664	93435	87638	135227	85849	91499	100382	92201	113939	87934	...
December	90864	80681	108937	103479	92436	97589	91845	99080	99770	103130	109664	97119	...

Births.—The births of 169,252 children were registered in the winter quarter that ended on 31st March. This number is absolutely the highest that has ever been returned in a winter quarter; and the rate of birth is 3,585 in 100,000 or much above the average, 3,499, of the season.

Increase of Population.—As the number of births amounted to 169,252, and the number of deaths to 103,208, the natural increase of population in the quarter was 66,044 in England. The number of emigrants of English origin during the three months was about 10,545, half of whom sailed for the Australian colonies, while nearly all the rest sailed to the United States. After deducting the emigrants, the increase is 55,499. The emigration from the United Kingdom was at its maximum about the year 1852, when 58,291 emigrants sailed from the stations in the winter quarter: the numbers fell to 36,677 in 1855, and to 21,859 in the first quarter of the present year.*

The Weather, and the Price of Provisions.—The weather, the price of provisions, and the state of employment, have considerable influence on the births, deaths, and marriages.

The weather is fully described in Mr. Glaisher's meteorological report. The mean temperature of the air was, on successive days, alternately higher and lower

England:—Annual Rate per cent. of Marriage, Birth, and Death, during the Years* 1846-56, *and the Quarters of those Years.*

Estimated Population of England in thousands in the middle of each Year.....	16925	17132	17340	17552	17766	17983	18206	18403	18618	18786	...	...
Years	1846	1847	1848	1849	1850	1851	1852	1853	1854	1855	Mean, 1846–56	1856
Marriages.....	·861	·793	·797	·808	·860	·858	·872	·894	·856	·808	·841	...
Births	3·383	3·152	3·247	3·294	3·340	3·425	3·428	3·328	3·408	3·381	3·339	...
Deaths	2·306	2·471	2·306	2·512	2·077	2·199	2·236	2·288	2·354	2·269	2·302	...
	Marriages.											
Quarters ended the last day of												
March	·757	·655	·661	·661	·702	·742	·730	·778	·726	·631	·704	...
June	·882	·826	·805	·822	·888	·864	·885	·883	·872	·822	·855	...
September	·822	·751	·755	·766	·840	·822	·836	·859	·812	·783	·805	...
December.....	·983	·940	·961	·986	1·010	1·000	1·027	1·053	1·013	·989	·996	...
	Births.											
March	3·498	3·488	3·252	3·575	3·321	3·567	3·582	3·578	3·523	3·602	3·499	3·585
June	3·551	3·265	3·474	3·523	3·530	3·557	3·509	3·464	3·722	3·534	3·513	...
September	3·251	2·945	3·211	3·056	3·281	3·317	3·291	3·177	3·294	3·265	3·209	...
December.....	3·256	2·938	3·038	3·053	3·253	3·270	3·298	3·100	3·111	3·128	3·145	...
	Deaths.											
March	2·157	2·850	2·794	2·462	2·261	2·388	2·354	2·613	2·452	2·918	2·525	2·186
June	2·144	2·506	2·313	2·341	2·107	2·224	2·221	2·355	2·216	2·279	2·271	...
September	2·382	2·163	2·005	3·057	1·917	2·015	2·185	1·985	2·425	1·854	2·199	...
December.....	2·545	2·389	2·108	2·199	2·045	2·176	2·165	2·214	2·330	2·041	2·221	...

* The table may be read thus, without reference to the decimal points:—In the year 1848, to 100,000 of the population of England there were 797 marriages, 3,247 births, and 2,306 deaths registered. The annual rates of marriage in each of the four quarters were ·661, ·805, ·755, and ·961 per cent.; the rates of death 2·794, 2·313, 2·005, and 2·108 per cent. In reading the population on the first line add three ciphers (000). The three months January, February, March, contain 90, in leap year 91 days; the three months April, May, June, 91 days; each of the two last quarters of the year 92 days. For this inequality a correction has been made in the calculation.

* From a Return with which the Registrar-General has been favoured by the Emigration Commissioners.

than the average in January and in February; it was low in March; but upon an average of the three months the heat predominated. The fall of rain was 4·8 in. at Greenwich, which is slightly below the average.

The prices of provisions are still high; wheat has been, on an average, 72*s.* 4*d.* the imperial quarter through the last three months, which is higher than the average price (69*s.* 11*d.*) during the winter of 1855, but lower than the average (79*s.* 6*d.*) of the winter of 1854. The wholesale price of beef (5¼*d.* a pound,) and mutton (5⅜*d.* a pound,) have been slightly lower than they were in the two previous winters. Potatoes in the three winters fell from 140*s.* a ton in 1854 to 112*s.* 6*d.* in 1855, and

The Average Prices of Consols, of Wheat, Meat, and Potatoes, also the Average Quantity of Wheat sold and imported Weekly, in each of the nine Quarters ended March 31st, 1856.

Quarters ended	Average Price of Consols (for Money.)	Average Price of Wheat per Quarter in England and Wales.	Wheat sold in the 290 Cities and Towns in England and Wales making Returns.	Wheat and Wheat Flour entered for Home Consumption at Chief Ports of Great Britain.	Average Prices of Meat per lb. at Leadenhall and Newgate Markets (by the Carcase).		Average Prices of Potatoes (York Regents) per Ton at Waterside Market, Southwark.
			Average Number of Quarters weekly.		Beef.	Mutton.	
1854	£						
Mar. 31.	91	79*s.* 6*d.*	60,022	103,519	4¼*d.*—6¼*d.* Mean 5¼*d.*	4½*d.*—7*d.* Mean 5¾*d.*	120*s.*—160*s.* Mean 140*s.*
June 30.	88⅝	78*s.* 4*d.*	55,842	103,331	4½*d.*—6¼*d.* Mean 5⅜*d.*	4¾*d.*—6¾*d.* Mean 5¾*d.*	137*s.*—172*s.* Mean 155*s.*
Sept. 30.	93⅞	63*s.* 10*d.*	56,389	48,135	4¾*d.*—6¾*d.* Mean 5¾*d.*	5*d.*—7*d.* Mean 6*d.*	75*s.*—85*s.* Mean 80*s.*
Dec. 31.	93⅝	68*s.* 0*d.*	128,783	19,513	4½*d.*—6¾*d.* Mean 5⅝*d.*	5*d.*—7*d.* Mean 6*d.*	95*s.*—105*s.* Mean 100*s.*
1855							
Mar. 31.	91⅞	69*s.* 11*d.*	88,000	33,821	4¾*d.*—6½*d.* Mean 5⅝*d.*	4¾*d.*—6½*d.* Mean 5⅝*d.*	105*s.*—120*s.* Mean 112*s.* 6*d.*
June 30.	90⅝	73*s.* 4*d.*	94,791	57,068	4½*d.*—6½*d.* Mean 5½*d.*	4¾*d.*—6¾*d.* Mean 5¾*d.*	110*s.*—130*s.* Mean 120*s.*
Sept. 30.	90⅝	76*s.* 1*d.*	94,545	51,511	5*d.*—6¾*d.* Mean 5⅞*d.*	5*d.*—7*d.* Mean 6*d.*	69*s.*—79*s.* Mean 74*s.*
Dec. 31.	88¼	79*s.* 4*d.*	126,893	42,358	4¾*d.*—6¾*d.* Mean 5¾*d.*	4¾*d.*—6¾*d.* Mean 5¾*d.*	90*s.*—100*s.* Mean 95*s.*
1856							
Mar. 31.	90⅝	72*s.* 4*d.*	92,152	48,018	4¼*d.*—6¼*d.* Mean 5¼*d.*	4¼*d.*—6½*d.* Mean 5⅜*d.*	78*s.*—93*s.* Mean 86*s.*
Col.	1	2	3	4	5	6	7

Note.—The total number of quarters of wheat sold in England and Wales for the 13 weeks ended March 31st, 1854, 780,282; for the 13 weeks ended June 30th, 1854, 725,946; for the 13 weeks ended September 30th, 1854, 733,059; for the 13 weeks ended December 31st, 1854, 1,674,173; for the 13 weeks ended March 31st, 1855, 1,143,999; for the 13 weeks ended June 30th, 1855, 1,232,284; for the 13 weeks ended September 30th, 1855, 1,229,082; for the 13 weeks ended December 31st, 1855, 1,649,610; and for the 13 weeks ended March 31st, 1856, 1,197,970. The total number of quarters entered for Home Consumption was, respectively, 1,345,743; 1,343,305; 625,755; 253,669; 439,676; 741,890; 669,639; 550,652; and 624,233.

to 86*s.* in 1856, so that the price of this important article of food has progressively fallen.

State of the Public Health.—The rate of mortality has been much lower in the first quarter of this year than it has been in any winter quarter since 1846. The rate is on an average in winter 2·525 per cent. per annum; in the past quarter it was only 2·186. The contrast between this rate of mortality and the rate of mortality in the winter of 1855 is striking; the rate was then 2·918. The deaths in the first three months of 1855 were 134,605; in the first three months of the present year 103,208, or less by 31,397 than the deaths in the previous winter. The deaths of Englishmen in the Crimea are not registered in England, otherwise the addition of their numbers would make the difference between the loss of life in the two winter quarters still greater. The high mortality of the army in the Crimea, as well as the low mortality on that distant coast, coincided with less intense but corresponding states of the nation at home.

A difference in the degrees of heat and cold appears to have been the chief cause of the difference in the mortality in England. The mean temperature at Greenwich was 34·1° in the winter quarter of 1855, and 40·0° in the winter quarter of 1856. The mean temperature of the month of February, 1855, was 29·4° (2·6° below the freezing point of water), and the mean temperature of February, 1856, was 42·0°, or 10° above the freezing point of water. The fatality of every degree of cold below the freezing point to old people is now well established; but a mild winter is sometimes

Deaths in the Winter Quarters, 1846-56.

	1846	1847	1848	1849	1850	1851	1852	1853	1854	1855	Total 1846–55 (10 Yrs.)	1856
In 125 Districts and 23 Sub-districts, comprising the chief towns	45658	57552	59701	53614	47786	54637	54844	59604	58947	68244	560587	54006
In the remaining Districts and Sub-Districts, of England and Wales, comprising chiefly small towns and country parishes ...	43826	62120	60331	52256	50644	50722	51514	58669	53023	66361	549466	49202
All England	89484	119672	120032	105870	98430	105359	106358	118273	111970	134605	1110053	103208

Area, Population, Deaths, and Mortality per cent. in the Winter Quarters, 1846-56.

	Area in Statute Acres.	Population Enumerated.		Deaths in 10 Winter Quarters, 1846–55.	Average Annual Rate of Mortality per Cent. of 10 Winter Quarters, 1846–55.	Average Annual Rate of Mortality per Cent. in the Winter Quarter 1856.
		June 6–7th, 1841.	March 31st, 1851.			
In 125 Districts, and 23 Sub-Districts, comprising the chief towns	2,149,800	6,838,069	8,247,017	560,587	2·745	2·387
In the remaining Districts and Sub-districts of England and Wales, comprising chiefly small towns and country parishes	35,175,115	9,076,079	9,680,592	549,466	2·278	1·969
All England	37,324,915	15,914,148	17,927,609	1,110,053	2·525	2·186

followed by an unhealthy autumn, against which our health officers should be watchfully on their guard.

A new sub-division of the country has been made; and with a view of placing in one group the entire population, 125 entire districts have been selected, which, together with 23 sub-districts, embraced in 1851, a population of 8,247,017 persons lodged on 2,149,800 acres of land, leaving 9,680,592 persons on the remaining 35,175,115 acres, which make up the territory of England and Wales. In round numbers there were 4 (or more exactly 3·836) persons to an acre in these large town districts, and one person to 4 (or more exactly 3·634) acres in the village and small town districts, so that the density of the population to a square mile in the two groups of districts was as 1 to 14.

The average rate of mortality in the last ten winters has been 2·525 per cent. per annum in all England; but the rate in the town districts has been 2·745, and in the other districts 2·278 per cent. per annum. The rates of mortality in the winter of 1856 were much below these averages; the town rate was 2·387, the other rate 1·969, the rate for the country generally 2·186.

The importance of these results is enhanced by the facts in the table, showing that the great increase of the population of England in the ten years after 1841 was found, in 1851, to be lodged in the towns. The population of the large towns was 6,838,069 in 1841, and 8,247,017 in 1851. The question of the health of towns is, therefore, a question of the strength of England.

The principal cause of the insalubrity of the dense districts is the want of adequate means to redistribute over the earth the organic matter which is reduced to refuse in the towns; and any proposal to throw the town guano wastefully into the rivers of the kingdom would be an imperfect and unsatisfactory solution of the problem.

The health of London has been already described in a Quarterly Summary of the Weekly Tables.

The mortality fell in every division; and in every county some improvement appears.

In the South-Eastern Division typhus and scarlatina are referred to in some districts; and the syphilitic gangrene which broke out in the previous quarter in Winchester caused three deaths at the commencement of this quarter. But the garrison is healthier than it was at Winchester; and the good effects of sanatory measures are already observed at Southampton.

In the South Midland Division four deaths from scarlatina occurred in one family in the Hatfield district. In Halton, near Runcorn, in another division, the family of a gamekeeper suffered severely:—"One of his children died on the 26th March, a second on the 27th, a third on the 28th, and a fourth on the 31st. Two other children, who are at home, have also had the fever, but are likely to recover." It would be well if the treatment were ascertained in these cases. Ten children died of croup at Haddenham in the Ely District; and croup also prevailed in Prittlewell, Rochford.

In the Eastern Division typhus visited some of the Essex districts; ague is prevalent in Tollesbury. About sixty persons were attacked by small-pox in the parish of Finchingfield, and four died.

In the South-Western Division the good effects of sanatory arrangements are noticed at Highworth, and notwithstanding the prevalence in some places of scarlatina and of typhus, the general mortality was low. The registrar of Charles the Martyr, Plymouth, says, "the number of twins is remarkable, eight double births having been registered; two more cases occurred, but as the children were still-born no entry could be made of them." The births of twins are also noticed in Falmouth and in a northern district, Chorlton-upon-Medlock, where one quadruple birth has been registered (three boys and a girl), together with six twin births. It is difficult to say whether these births thus occurring are referable to any general law, or are merely accidental fluctuations in small numbers.

The reduction of the mortality in the West Midland Counties is striking, and extends over the mining districts. The deaths in Birmingham and Aston were 2,101 and 1,504 in the winter quarters of 1855 and 1856. One of the registrars of Coventry points out the defects which are now generally recognized in the Vaccination Act.

In some districts of Lincolnshire and of Nottinghamshire typhus and scarlatina

have prevailed; but taking the whole of the North Midland Division the rate of mortality has been lower than it was in the two preceding winters.

In the North-Western Division the deaths are below the average. The registrar of Stockport says:—"That there is an entire absence of fever, and that sanatory arrangements have been carried out by the corporation with the most salutary effects." 3,322 persons died in Liverpool and West Derby; the deaths in the winter of 1855 were 3,678. In Manchester and Salford the diminution of mortality has been greater; the deaths fell from 3,262 in the winter of 1855 to 2,304 in 1856. It is gratifying to observe that the number of persons who obtain medical attendance in Manchester is now much greater than it was formerly; and to this circumstance, in conjunction with others, Mr. Leigh, the registrar of Deansgate, conceives it not improbable that the diminished mortality is due. His observations on this important subject are subjoined:—

"473, 2. Manchester; Deansgate.—Births 292, Deaths 210. Of the 210 deaths (a number much below the average for this quarter,) 16 were coroners' cases, leaving 194 as the mortality from ordinary causes. Of these, 147 were certified; 27 had medical attendance, though certificates were refused, and are therefore entered as 'not certified.' 20 only had no medical attendance, and these were chiefly very young children. The large proportion of cases in which there was medical attendance, being more than nine-tenths of the whole, coupled with the very small actual mortality, would be very gratifying if one could be quite certain of the relation between the two circumstances. It cannot be questioned that skilful aid rendered in sickness must often prevent death, and from the numbers here given it is to be supposed that all had this with the exception of 20. It may be inferred, therefore, either that medical aid is more within the reach of the poor than formerly, or that the confidence of the people in skilled labour over intuitive knowledge is rather on the increase. There is a third hypothesis somewhat less flattering, that inasmuch as by a recent Act of Parliament copies of registers of deaths, wherein a statement whether or not there has been any medical attendance is included, must be produced before any money can be obtained from children's burial clubs; this may have had something to do with the more general application for skilled medical aid. Be the cause what it may, however, it is a fact that whilst for several years after the certificate system was adopted in registration, not more than one-half of the cases were certified to have had proper medical attendance, the number in the last quarter amounts to more than nine-tenths. The cases enumerated as 'not certified,' were nearly all attended by one or two surgeons, who have lately refused to give certificates altogether. The continued and steady course of sanatory improvement, together with the unusually fine weather that we have had, must also undoubtedly have diminished the usual amount of sickness and consequent mortality. Nor must we lose sight of the influence of the war in diminishing employment, by which the mothers are retained at home, looking after their children, instead of being occupied in labour elsewhere. The occupation of adult females in mills, however conducive it may be to their comforts by increasing the total earnings of families, is really the opprobrium of our manufacturing system. The children of such mothers are left to the care of other children but little older than themselves. Irregularities in times of feeding, improper diet, neglect for long intervals in sickness, scanty clothing, exposure to inclement weather, and the free use of opiates, all work their effects on the poor little creatures, and the wonder is, not that so many should die, but that so many should live. Burns, scalds, &c., from the same source of neglect, swell the coroners' lists. Of the 210 deaths, 108, or rather more than half, were under five years old, and one-fifth of the whole under six months old."

The decrease of the number of deaths in Yorkshire is 1,929. In the three last winters the deaths in the Leeds and Hunslet districts have descended from 1,375 and 1,377 to 1,136; in Sheffield from 807 and 891 to 761; in Hull and Sculcoates from 534 and 657 to 484.

In the Northern Division the mortality of Durham remains nearly as high as it was in 1855; scarlatina is epidemic in many districts.

In Monmouthshire and Wales the deaths, which were 9,077 in the winter of 1855, fell to 6,777, or they were less by 2,300 than the deaths in the cold winter of last year.

Marriages Registered in the Quarters ended 31st December, 1853-55; Births and Deaths Registered in the Quarters ended 31st March, 1854-56, in the Divisions of England.

DIVISIONS.	Area in Statute Acres.	Population, 1851.	Marriages			Births			Deaths		
			Registered in the Quarter ended the last Day of								
			December			March			March		
			1853.	1854.	1855.	1854.	1855.	1856.	1854.	1855.	1856.
England	37,324,915	17,927,609	49,026	47,666	47,038	160,892	166,186	169,252	111,970	134,605	103,208
Divisions.											
I. London	78,029	2,362,236	7,272	6,997	6,838	22,289	22,821	23,094	16,383	19,605	14,539
II. South Eastern Counties	4,065,105	1,628,386	3,952	3,677	4,229	13,594	13,669	14,213	8,446	11,253	8,384
III. South Midland Counties	3,201,290	1,234,332	3,134	2,999	3,170	10,183	10,219	10,757	6,547	8,693	6,219
IV. Eastern Counties	3,214,099	1,113,982	3,243	3,124	3,167	8,878	9,521	9,590	6,104	7,659	5,545
V. South Western Counties	4,994,490	1,803,291	3,913	3,853	3,786	14,358	14,575	14,500	9,907	13,183	8,885
VI. West Midland Counties	3,865,332	2,136,573	6,576	6,402	5,984	20,875	21,136	21,578	14,993	16,981	12,509
VII. North Midland Counties	3,540,797	1,215,501	3,049	3,031	2,946	10,462	10,703	11,197	7,227	8,253	6,367
VIII. North Western Counties	2,000,227	2,488,438	7,175	7,211	6,554	25,166	25,847	25,724	18,506	20,820	17,650
IX. Yorkshire	3,654,636	1,789,047	5,369	4,856	4,778	16,598	17,374	17,475	11,194	12,268	10,339
X. Northern Counties	3,492,322	969,126	2,263	2,404	2,473	8,677	9,759	10,397	5,568	6,813	5,995
XI. Monmouthshire and Wales	5,218,588	1,186,697	3,080	3,112	3,113	9,812	10,562	10,727	7,095	9,077	6,777

On the Meteorology of England and Scotland during the Quarter ended March 31st, 1856. By James Glaisher, Esq., F.R.S., *Sec. of the British Meteorological Society.*

The temperature of the air till the end of February was, a few days together, in excess and defect alternately. The temperature was low throughout March.

The periods and average daily amount of excess were, January 1st to 8th, $6\frac{1}{4}°$; January 16th to 27th, $7\frac{1}{4}°$; February 5th to 16th, $8\frac{3}{4}°$; and from February 22nd to 28th, $10\frac{1}{2}°$.

The periods and average daily amount of defect were, January 9th to 15th, $3\frac{1}{4}°$; January 28th to February 4th, and February 16th to 22nd, $4\frac{1}{2}°$; and the whole of March 3° daily.

The temperature of January and February was higher than their averages, and that of March was lower. Upon the quarter the temperature was somewhat in excess.

The reading of the barometer at the level of the sea decreased from 29·99 inches at the beginning of the year to 29·02 inches by January 7th; increased to 30·72 inches by the 13th; decreased to 29·17 inches by the 21st; increased to 30·25 inches by the 31st; decreased to 29·71 inches by February 7th; then increased gradually, passing above 30 inches on the 22nd to 30·69 inches by March 1st; then decreased gradually, passing below the point 30 inches on March 12th to 29·84 inches by the 19th; and ranged between this point and 30·20 inches to the end of the quarter.

The pressure of the atmosphere in January was much below, and in the remaining two months was above its average value. Upon the whole quarter the pressure was somewhat in excess.

The water mingled with the air was somewhat in excess during the first two months, and in defect of the last month of the quarter.

The degree of humidity was rather above its average in January and February, and below it in March.

The daily ranges of temperature were of their average values in January, but were smaller in February and March than their averages.

Rain was somewhat in excess in January and in defect in February and March, particularly in the latter month.

The general direction of the wind for the quarter at places south of latitude 54° was East or a compound of the East, and the least prevalent was the West. At places situated north of this parallel of latitude the West, or a compound of the West, rather preponderated, but there was very little difference in the resulting numbers for the four cardinal points.

The mean temperature of the air at Greenwich for the quarter ended February, constituting the three autumn months, was 39°·0, being $-0°·3$ below the average of 85 years. (See table, next page.)

Thunderstorms occurred, or thunder was heard and lightning seen, on the 24th January at Jersey, Ryde, Clifton, Lewisham, London, Rose Hill, Hartwell, Cardington, Worcester, and Nottingham; on the 25th at Ryde and Lewisham; on the 28th at Hawarden, Warrington, and Liverpool. On the 12th February at York.

Thunder was heard, but lightning was not seen, on the 23rd January at Helston. On the 14th February at Teignmouth; on the 16th at Wakefield; and on the 26th at Jersey. On the 17th March at Jersey and Guernsey; and on the 19th at Rose Hill.

Lightning was seen, but thunder was not heard, on the 3rd January at Oxford. On the 3rd February at Cardington; on the 5th at Grantham; on the 7th at Makerstoun, Anstruther Wester, and Arbroath; on the 10th at Bedford; and on the 14th at Clifton. On the 29th March at Cardington.

Hail fell on 17 days in January, 9 days in February, and 4 days in March.

Auroræ was seen on the 9th January at Nottingham; on the 26th at Clifton; and

on the 31st at Arbroath. On the 7th and 25th February at Arbroath. On the 6th March at Arbroath; on the 13th at Oxford; and on the 27th and 30th at Arbroath.

Fog was prevalent on the 1st January at Paddington, Berkhampstead, Eign, Cardington, Lampeter, Holkham, Wakefield, and North Shields; on the 2nd at Paddington, Bicester, Berkhampstead, Knebworth, Eign, Cardington, Holkham, Belvoir, Boston, Wakefield, Stonyhurst, North Shields, West Anstruther, and Arbroath; on the 3rd at Paddington, Berkhampstead, Cardington, Wakefield, North Shields, West Anstruther, and Arbroath; on the 4th at Paddington, Berkhampstead, Cardington, Wakefield, North Shields, Makerstoun, West Anstruther, and Arbroath; on the 5th at Teignmouth, Exeter, Clifton, Paddington, Berkhampstead, Wakefield, West Anstruther, and Arbroath; on the 6th at Teignmouth, Exeter, Paddington, Bayswater, Berkhampstead, Wakefield, Stonyhurst, Scarborough, North Shields, Makerstoun, West Anstruther, Arbroath, and Elgin; on the 7th at Truro, Paddington, Berkhampstead, Knebworth, Holkham, Boston, Wakefield, Stonyhurst, Scarborough, North Shields, Makerstoun, West Anstruther, and Arbroath; on the 8th at London, Eign, Holkham, Bowdon, and Wakefield; on the 9th at Eign; on the 10th at Bowdon; on the 11th at Bowden and Stonyhurst; on the 13th at Stonyhurst; on the 14th at Paddington, Wakefield, Stonyhurst, and North Shields; on the 15th at Paddington, London, Berkhampstead, Wakefield, Stonyhurst, and North Shields; on the 16th at Clifton, Paddington, Berkhampstead, Oxford, Hartwell Rectory, Knebworth, Royston, Eign, Worcester, Stonyhurst, and West Anstruther; on the

1856. Months.	Temperature of Air. Mean.	Air. Diff. from Average of 85 Years.	Air. Diff. from Average of 15 Years.	Evaporation. Mean.	Evaporation. Diff. from Average of 15 Years.	Dew Point. Mean.	Dew Point. Diff. from Average of 15 Years.	Air—Daily Range. Mean.	Air—Daily Range. Diff. from Average of 14 Years.	Water of the Thames.	Elastic Force of Vapour. Mean.	Elastic Force of Vapour. Diff. from Average of 14 Years.	Weight of Vapour in a Cubic Foot of Air. Mean.	Weight of Vapour in a Cubic Foot of Air. Diff. from Average of 14 Years.
	°	°	°	°	°	°	°	°	°	°	In.	In.	Gr.	Gr.
an.	39·2	+3·5	+1·3	38·2	+1·1	36·4	+1·4	8·5	+0·2	39·6	·215	+·011	2·6	+0·2
eb.	42·0	+3·8	+3·8	40·3	+3·6	37·8	+3·7	9·7	−1·1	41·2	·227	+·026	2·7	+0·4
ar.	38·7	−2·2	−3·0	36·6	−4·2	33·1	−2·6	12·4	−2·1	42·9	·188	−·030	2·2	−0·3
ean.....	40·0	+1·7	+0·7	38·5	+0·2	35·8	+2·5	10·2	−1·0	40·9	·210	+·002	2·5	+0·1

1856. Months.	Degree of Humidity. Mean.	Degree of Humidity. Diff. from Average of 14 Years.	Reading of Barometer. Mean.	Reading of Barometer. Diff. from Average of 14 Years.	Weight of a Cubic Foot of Air. Mean.	Weight of a Cubic Foot of Air. Diff. from Average of 14 Years.	Rain. Amnt.	Rain. Diff. from Average of 40 Years.	Daily Horizontal Movement of the Air.	Reading of Thermometer on Grass. Number of Nights it was: At or below 30°.	Between 30° and 40°.	Above 40°.	Lowest Reading at Night.	Highest Reading at Night.
			In.	In.	Gr.	Gr.	In.	In.	Miles.				°	°
an.	91	+ 2	29·468	−·277	547	− 9	2·6	+0·8	103	8	14	1	15·0	41·0
eb.	87	+ 1	29·899	+·141	552	− 2	1·1	−0·6	123	11	11	4	19·5	43·0
ar.	82	− 1	30·011	+·218	558	+ 8	1·1	−0·5	99	22	8	0	8·0	40·0
ean.....	86·6	+ 1	29·793	+·027	552	− 1	Sum 4·8	Sum −0·3	108	Sum 41	Sum 33	Sum 5	8·0	43·0

Note.—In reading this table it will be borne in mind that the sign (−) minus signifies below the average, and that the sign (+) plus signifies above the average.

17th at Oxford, Knebworth, Wakefield, Stonyhurst, North Shields, West Anstruther, and Arbroath; on the 18th at Paddington, Oxford, Wakefield, Stonyhurst, and Arbroath; on the 19th at Hawarden, Wakefield, North Shields, West Anstruther, and Arbroath; on the 20th at Teignmouth, Hawarden, Wakefield, Stonyhurst, North Shields, and Makerstoun; on the 21st at Teignmouth, Paddington, London, Rose Hill, Berkhampstead, Oxford, Hartwell, Knebworth, Royston, Cardington, and Holkham; on the 22nd at Paddington; on the 24th at West Anstruther and Arbroath; on the 26th at Wakefield; on the 28th at Clifton; and on the 31st at Paddington. On the 1st February at Paddington, Wakefield, Scarborough, and West Anstruther; on the 2nd at Clifton, London, Lambeth, Holkham, Wakefield, West Anstruther, and Arbroath; on the 3rd at Berkhampstead, Eign, Holkham, Wakefield, West Anstruther, and Arbroath; on the 4th at Teignmouth, Clifton, Paddington, Knebworth, Eign, Holkham, Stonyhurst, Makerstoun, and Arbroath; on the 5th at Paddington, Hartwell, and Arbroath; on the 7th at Paddington; on the 8th at Isle of Man; on the 10th at Berkhampstead and Wakefield; on the 11th at Paddington, Lambeth, Berkhampstead, Knebworth, Wakefield, North Shields, Makerstoun, West Anstruther, and Arbroath; on the 12th at Wakefield and Makerstoun; on the 13th at Clifton, Paddington, Lambeth, and Wakefield; on the 15th at Bayswater, West Anstruther, and Arbroath; on the 16th at Paddington, Knebworth, Wakefield, Scarborough, Makerstoun, and West Anstruther; on the 17th at Paddington, Lambeth, Wakefield, West Anstruther, and Arbroath; on the 18th at Paddington and Wakefield; on the 19th at Battersea and Paddington; on the 22nd at Paddington, Oxford, Holkham, Bowdon, and Scarborough; on the 23rd at Paddington, Oxford, Lampeter, Bowdon, Warrington, and Stonyhurst; on the 24th at Clifton, Eign, Warrington, Wakefield, and Stonyhurst; on the 25th at Paddington and Lambeth; on the 27th at Paddington, Lambeth, Oxford, and Scarborough; on the 28th at Lambeth, Oxford, Hartwell, and Wakefield; on the 29th at Paddington, Lampeter, and Scarborough. On the 1st March at Paddington, Knebworth, Eign, Hawarden, Wakefield, Scarborough, and West Anstruther; on the 2nd at Lambeth; on the 3rd at Lambeth and Holkham; on the 4th and 5th at Eign and Holkham; on the 6th at Eign; on the 7th at Paddington; on the 8th at Clifton, Paddington, Berkhampstead, Norwich, Holkham, Stonyhurst, North Shields, and Makerstoun; on the 9th at Teignmouth, Clifton, Rose Hill, Berkhampstead, Hartwell Oxford, Eign, Hawarden, and Stonyhurst; on the 10th at Teignmouth and Oxford; on the 13th and 15th at Wakefield; on the 17th at Teignmouth, Clifton, Oxford, Knebworth, and Eign; on the 18th at Teignmouth, Eign, and Wakefield; on the 19th at Knebworth, Hartwell, Wakefield, and Arbroath; on the 20th at Oxford, Knebworth, Holkham, Wakefield, and Stonyhurst; on the 21st at Wakefield; on the 22nd at Teignmouth and Wakefield; and on the 24th, 25th, 29th, 30th, and 31st, at Wakefield.

Snow fell on 33 days during the quarter.

Solar Halos were seen on 21 days during the quarter.

Lunar Halos were seen on 18 days during the quarter.

The elm leaf buds first appeared on the 27th February at Teignmouth. On the 26th March at Hawarden; and on the 29th at Helston.

Hawthorn leaf buds first appeared on the 29th February at Hawarden. On the 1st March at Arbroath; on the 20th at Guernsey; and on the 8th at Knebworth.

Plum in blossom on the 28th March at Arbroath.

Peach in blossom on the 10th March at Arbroath; on the 15th at Battersea; on the 23rd at Jersey.

Sycamore leaf buds first appeared on the 25th March at Guernsey; and on the 26th at Hawarden.

Horse-chesnut leaf buds first appeared on the 17th March at Hawarden; on the 20th at Knebworth; and on the 25th at Jersey.

Lime leaf buds first appeared on the 31st March at Guernsey.

Common poplar leaf buds first appeared on the 31st March at Clifton.

The oak leaf buds first appeared on the 31st March at Teignmouth.

The apple and pear leaf buds first appeared on the 20th March at Jersey.

Meteorological Table, Quarter ended March 31st, 1856.

Names of Stations.	Mean Pressure of Dry Air reduced to the Level of the Sea.	Highest Reading of the Thermometer.	Lowest Reading of the Thermometer.	Range of Temperature in the Quarter.	Mean Monthly Range of Temperature.	Mean Daily Range of Temperature.	Mean Temperature of the Air.	Mean Degree of Humidity.	Wind.					Mean Amount of Cloud.	Rain.	
									Mean estimated Strength.	Relative Proportion of					Number of Days on which it fell.	Amount collected.
										N.	E.	S.	W.			
	in.	°	°	°	°	°	°									in.
Jersey	29·588	55·0	26·0	29·0	23·0	5·9	42·9	92	1·6	....	....	...	....	5·5	31	5·8
Falmouth	....	58·0	26·0	32·0	27·3	8·8	44·8	....	1·7	....	....	....	....	7·5	44	9·2
Truro	29·676	57·0	21·0	36·0	32·3	11·2	43·8	84	1·4	....	....	....	....	6·9	40	9·1
Teignmouth	29·709	55·5	25·9	29·6	27·2	9·0	42·7	85	0·9	23	28	18	18	7·1	33	8·3
Exeter	29·705	58·5	22·8	35·7	32·4	11·9	42·7	86	1·2	27	22	26	6	7·0	37	9·8
Newport	29·735	55·9	25·3	30·6	26·8	9·6	42·0	85	2·1	19	35	15	19	6·7	29	6·4
Clifton	29·671	57·1	21·9	35·2	31·3	10·0	37·1	88	0·4	14	33	15	18	7·0	40	6·5
Royal Observatory	29·761	58·0	24·3	33·7	29·2	10·2	40·0	87	....	30	42	37	25	8·0	34	4·4
Rose Hill	29·759	56·7	21·2	35·5	31·9	11·5	39·5	87	1·7	....	....	....	....	8·3	31	4·8
Oxford	29·745	56·6	21·3	35·3	31·3	10·3	39·8	90	1·6	....	....	....	....	7·7	32	5·1
Hartwell Rectory	29·719	59·0	22·0	37·0	31·7	10·6	39·8	90	0·8	25	26	22	18	7·6	....	....
Royston	29·786	58·1	19·3	38·8	33·5	11·1	39·7	87	....	21	21	22	20	7·4	48	3·6
Lampeter	29·724	59·8	16·4	43·4	34·6	12·4	40·4	87	0·7	17	30	20	13	6·5	42	9·2
Norwich	29·745	56·0	19·0	37·0	33·3	10·5	39·1	86	1·6	....	....	....	....	7·9	37	5·0
Derby	29·679	56·0	18·0	38·0	33·3	11·5	39·7	90	....	....	....	....	....	....	36	5·5
Holkham	29·775	55·5	17·5	38·0	26·6	9·3	39·1	87	1·3	....	....	....	....	7·3	46	3·8
Nottingham	29·789	59·2	18·5	40·7	31·6	11·0	39·4	83	0·3	....	....	....	....	7·5	39	5·8
Hawarden	29·691	51·5	23·0	28·5	28·5	9·6	39·8	89	1·4	....	....	....	....	7·9	24	5·2
Warrington	29·724	58·3	17·2	41·1	32·8	9·7	40·0	89	0·4	17	29	32	15	6·5	30	6·0
Liverpool	29·777	56·6	27·4	29·2	23·4	7·6	41·6	83	1·0	....	....	....	....	7·1	28	4·8
Wakefield	29·761	60·7	16·5	44·2	35·7	11·9	39·4	84	1·4	24	26	13	24	7·8	46	4·1
York	....	54·0	14·0	40·0	31·3	9·0	37·7	86	....	....	....	....	....	....	37	4·0
Scarborough	....	53·6	22·2	31·4	23·6	7·0	38·8	86	2·3	24	21	19	25	....	24	2·3
North Shields	....	53·0	19·5	33·5	27·6	6·8	38·4	91	1·8	26	17	23	24	7·2	53	6·7
Arbroath	29·748	54·0	21·0	33·4	28·0	9·6	36·9	83	0·9	26	21	13	25	7·0	31	5·8

REVENUE.

An Abstract of the Net Produce of the Revenue of the United Kingdom *in the Years and Quarters ended 31st March, 1855 and 1856; showing the Increase or Decrease thereof.—**(Continued from page 91.)*

Sources of Revenue.	Years ended 31st March.			
	1855.	1856.	Increase.	Decrease.
	£	£	£	£
Customs	20,998,774	21,788,770	789,996	....
Excise	16,341,128	16,636,670	295,542	....
Stamps	7,132,949	6,894,307	....	238,642
Taxes	3,136,143	2,958,626	....	177,517
Property Tax	11,254,637	14,814,757	3,560,120	....
Post Office	1,334,157	1,171,695	....	162,462
Crown Lands	272,572	281,516	8,944	....
Miscellaneous	736,458	1,158,148	421,690	....
Totals	61,206,818	65,704,489	5,076,292	578,621
			Net Increase £4,497,671	

Sources of Revenue.	Quarters ended 31st March.			
	1855.	1856.	Increase.	Decrease.
	£	£	£	£
Customs	4,728,111	5,225,169	497,058	....
Excise	2,594,518	2,631,600	37,082	....
Stamps	1,822,239	1,766,473	....	55,766
Taxes	200,030	207,738	7,708	....
Property Tax	5,899,334	6,837,280	937,946	....
Post Office	329,923	327,399	....	2,524
Crown Lands	66,000	67,000	1,000	....
Miscellaneous	243,361	298,502	55,141	....
Totals	15,883,516	17,361,161	1,535,935	58,290
			Net Increase £1,477,645	

An Account showing the Net Revenue and other Receipts of the Quarter ended the 31st of March, 1856; the Application of the same, and the Charge of the Consolidated Fund for the said Quarter, together with the Surplus or Deficiency upon such Charge.

	£	£
Surplus balance beyond the charge of the Consolidated Fund, for the quarter ended December 31st, 1855, viz.:—		
Great Britain		
Ireland £411,784		
		411,784
Net Income received in the quarter ended March 31st, 1856, as shown in page 196		17,361,161
Amount of Exchequer Bills (Supply) and Exchequer Bonds issued in the quarter ended March 31st, 1856, in full of Grant of £7,000,000		3,477,750
Amount received in the quarter ended March 31st, 1856, in part of Loan of £5,000,000		3,501,000
Money received by sale of Exchequer Bills issued to replace in part the Amount of Supply Bills paid off in Money out of the Ways and Means of the year 1855–6		500,000
Money received in lieu of Exchequer Bills, in part of Funding of £3,000,000		622,000
Amount received in the quarter ended March 31st, 1856, in repayment of advances for Public Works, &c.		285,383
Saving on the charge for Diplomatic Salaries for the year 1855		15,624
		26,174,707
Balance, being the deficiency on the 31st Mar., 1856, upon the charge of the Consolidated Fund in Great Britain, to meet the Dividends and other Charges payable in the quarter to June 30th, 1856, and for which Exchequer Bills (Deficiency) will be issued in that quarter		2,569,685
		£28,744,392

	£	£
Amount applied out of the net income for the quarter ended March 31st, 1856, to redemption of Exchequer Bills (Deficiency) for the quarter ended December 31st, 1855		3,879,750
Exchequer Bills redeemed with money received under the Act for Funding Exchequer Bills		463,000
Net amount applied out of the Income to supply services in the quarter ended March 31st, 1856		15,832,269
Charges of the Consolidated Fund for the quarter ended March 31st, 1856, viz.:—		
Interest of the Permanent Debt	£5,592,594	
Terminable Debt	1,419,314	
Interest of Exchequer-Bills (Deficiency)	8,114	
The Civil List	101,233	
Other charges on Consolidated Fund	314,271	
Advances for Public Works, &c.	326,980	
		7,762,506
Balance of Money received under the Act for Funding Exchequer Bills, reserved		159,000
Surplus Balance beyond the charge of the Consolidated Fund, for the quarter ended March 31st, 1856, viz.:—		
Great Britain		
Ireland	647,867	
		647,867
		£28,744,392

CORN.

Average Prices of Corn per Imperial Quarter in England and Wales, during each Week of the First Quarter of 1856; *together with the Monthly and Quarterly Average.*—(*Continued from p.* 93.)

[Communicated by H. F. Jadis, Esq., Comptroller of Corn Returns.]

Weeks ended on a Saturday, 1856.	Weekly Average.					
	Wheat.	Barley.	Oats.	Rye.	Beans.	Peas.
	s. *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*
January 5	76 10	39 0	26 9	52 7	47 7	47 3
„ 12	76 2	38 3	25 11	53 6	46 5	45 7
„ 19	76 1	37 8	26 7	53 4	46 0	44 9
„ 26	76 11	38 4	25 8	54 8	45 3	43 4
Average for January	76 6	38 3	26 2	53 6	46 3	45 2
February 2	75 10	38 6	25 5	53 2	44 5	43 1
„ 9	73 8	37 5	24 6	51 4	43 4	42 2
„ 16	71 7	37 2	23 10	50 4	42 7	41 6
„ 23	69 2	35 8	23 6	45 4	41 7	39 6
Average for February	72 6	37 2	24 3	50 0	42 11	41 6
March 1	69 7	35 6	23 9	47 2	41 5	39 5
„ 8	69 11	35 11	24 1	46 6	40 10	40 3
„ 15	67 11	36 3	23 2	43 2	41 0	40 3
„ 22	67 5	37 2	23 2	43 5	40 7	39 6
„ 29	69 10	38 1	24 0	46 5	41 3	40 1
Average for March	68 11	36 7	23 7	45 4	41 0	39 10
Average for the Quarter ..	72 4	37 3	24 7	49 3	43 3	42 0

STOCKS AND SHARES.

Fluctuations in the Stock and Share Markets during the Months of January, February, and March, 1856.—(*Continued from p.* 93.)

Stocks and Shares.	Amt. of Share.	Amt. Paid.	Price on the			Highest Price during the Months of			Lowest Price during the Months of		
			1 Jan.	1 Feb.	1 Mar.	Jan.	Feb.	Mar.	Jan.	Feb.	Mar.
Consols	...	...	88⅛ to ¼	90¼ to ½	91 to ⅛	91⅝	92½	93⅛	85⅝	90	91
Exchequer Bills	...	...	11*s.* to 7*s.* Dis.	10*s.* to 5*s.* Dis.	2*s.* Dis. to 1*s.* Pm	1*s.* Pm.	1*s.* Pm.	5*s.* Pm.	12*s.* Dis.	12*s.* Dis.	2*s.* Dis
Railways.											
Brighton	Stock	100	94	98	98⅛	100½	98½	102¾	93	96½	98¼
Caledonian	„	100	54	56½	56¼	57½	57¾	61¼	53½	55⅜	56
Eastern Counties	„	20	8⅞	9¾	9⅛	9¼	10⅜	10¼	8	9⅛	9⅛
Great Northern	„	100	88	92	93	97½	96½	95½	87	90	91¾
Great Western	„	100	52½	58½	59½	58¾	61	64⅞	51½	54¾	59¼
London & North-Western	„	100	94	99¾	99½	99¼	102⅞	102¾	93¼	98½	99
Midland	„	100	64	70	69¼	69½	71⅝	75¼	62½	69	69¼
Lancashire and Yorkshire	„	100	77	81¾	80¼	81¾	83	88½	76	80½	80¼
North Staffordshire	20	17½	9	9¾	11	10½	11	12	8⅜	9¾	10⅛
South-Eastern	Stock	100	57	62	65½	61¾	67¼	73⅞	56	61½	65¼
South-Western	„	100	85½	95	93	90	96	96	84	92	92½
York, Newcastle, & Berwick	„	100	67½	74	76	73½	78¾	80	66½	74	75
York and North Midland..	„	100	45	49	51¾	49½	53⅜	57½	44¼	49	51½
Northern of France	20	16	35¼	37	39¼	36¾	39½	39¾	33⅝	36¼	38½
East Indian	20	20	21¾	22	21¾	22⅛	22⅛	22¾	20⅝	21¼	21⅝

CURRENCY.

Bank of England.

An Account, pursuant to the Act 7th and 8th Victoria, c. 32, for each Week ended on a Saturday, for the First Quarter of 1856.—(*Continued from p.* 95.)

[Compiled from the "Bankers' Magazine."]

ISSUE DEPARTMENT.

Date.	Notes Issued.	Notes in hands of Public.	Government Debt.	Other Securities.	Gold Coin and Bullion.	Silver Bullion.
1856.	£	£	£	£	£	£
Jan. 5 ...	24,421,180	18,900,805	11,015,100	3,459,900	9,946,180	...
„ 12 ...	24,274,305	19,387,300	11,015,100	3,459,900	9,799,305	...
„ 19 ...	24,283,870	19,370,670	11,015,100	3,459,900	9,808,870	...
„ 26 ...	24,173,580	19,298,605	11,015,100	3,459,900	9,698,580	...
Feb. 2 ...	24,532,620	19,120,635	11,015,100	3,459,900	10,057,620	...
„ 9 ...	24,407,875	18,803,375	11,015,100	3,459,900	9,932,875	...
„ 16 ...	24,367,835	18,724,270	11,015,100	3,459,900	9,892,835	...
„ 23 ...	24,390,330	18,541,520	11,015,100	3,459,900	9,915,330	...
Mar. 1 ...	24,428,230	18,935,225	11,015,100	3,459,900	9,953,230	...
„ 8 ...	24,384,620	18,620,000	11,015,100	3,459,900	9,909,620	...
„ 15 ...	24,378 095	18,493,230	11,015,100	3,459,900	9,903,095	...
„ 22 ...	24,221,825	18,385,080	11,015,100	3,459,900	9,746,825	...
„ 29 ...	24,306,970	19,017,190	11,015,100	3,459,900	9,831,970	...

BANKING DEPARTMENT.

Date.	Proprietors' Capital.	Rest.	Public Deposits.	Other Deposits.	Seven Day and other Bills.	Total Dr.
1856.	£	£	£	£	£	£
Jan. 6 ...	14,553,000	3,285,323	5,514,535	12,607,840	849,795	36,810,493
„ 12 ...	14,553,000	3,330,673	3,638,609	13,967,508	843,874	36,333,664
„ 19 ...	14,553,000	3,365,212	3,858,237	13,512,245	826,250	36,114,944
„ 26 ...	14,553,000	3,376,632	3,264,203	12,871,553	844,027	34,909,415
Feb. 2 ...	14,553,000	3,410,082	3,782,879	13,807,258	815,880	36,369,099
„ 9 ...	14,553,000	3,492,520	3,683,327	13,049,256	798,031	35,576,134
„ 16 ...	14,553,000	3,505,653	4,164,823	12,964,125	770,261	35,957,862
„ 23 ...	14,553,000	3,470,046	4,141,551	14,762,364	713,094	37,640,055
Mar. 1 ...	14,553,000	3,779,752	4,083,033	13,918,279	747,129	37,081,193
„ 8 ...	14,553,000	3,792,570	4,376,186	13,285,084	777,919	36,784,759
„ 15 ...	14,553,000	3,805,380	5,506,124	12,650,535	756,330	37,271,369
„ 22 ...	14,553,000	3,813,664	5,638,865	12,107,043	726,362	36,838,934
„ 29 ...	14,553,000	3,827,865	6,838,842	11,851,130	765,305	37,842,142

Date.	Government Securities.	Other Securities.	Notes.	Gold and Silver Coin.	Total Cr.
1856.	£	£	£	£	£
Jan. 5 ...	10,827,515	19,871,874	5,520,375	590,729	36,810,493
„ 12 ...	13,413,459	17,415,554	4,887,005	617,646	36,333,664
„ 19 ...	13,728,246	16,857,056	4,913,200	616,442	36,114,944
„ 26 ...	12,636,261	16,750,656	4,874,975	647,523	34,909,415
Feb. 2 ...	12,092,361	18,216,497	5,411,985	648,256	36,369,099
„ 9 ...	11,422,361	17,868,429	5,604,500	680,814	35,576,134
„ 16 ...	11,931,006	17,743,632	5,643,565	639,659	35,957,862
„ 23 ...	11,946,006	19,185,177	5,848,810	660,062	37,640,055
Mar. 1 ...	11,451,006	19,494,762	5,493,005	646,420	37,081,193
„ 8 ...	11,451,006	18,928,343	5,764,620	640,790	36,784,759
„ 15 ...	11,451,006	19,285,028	5,884,865	650,470	37,271,369
„ 22 ...	11,951,006	18,425,297	5,836,475	625,886	36,838,934
„ 29 ...	11,871,821	20,063,178	5,289,780	617,363	37,842,142

CURRENCY.—*Continued.*

Country Banks.

Average amount of Promissory Notes in Circulation in England and Wales in each Week ended on a Saturday, for the First Quarter, of 1856.—(*Continued from page* 96.)

[Compiled from the "Bankers' Magazine."]

England and Wales.

Date.	Private Banks.	Joint Stock Banks.	Total.
1856.	£	£	£
Jan. 5	3,898,122	3,055,894	6,954,016
,, 12	3,974,913	3,128,674	7,103,587
,, 19	3,943,218	3,094,192	7,037,410
,, 26	3,892,143	3,034,262	6,926,405
Feb. 2	3,828,232	2,979,973	6,808,203
,, 9	3,760,136	2,953,349	6,713,485
,, 16	3,713,673	2,954,834	6,668,507
,, 23	3,680,023	2,960,781	6,640,804
Mar. 1	3,675,156	2,967,215	6,642,371
,, 8	3,697,909	3,009,007	6,706,916
,, 15	3,705,077	3,037,165	6,742,242
,, 22	3,743,731	3,094,467	6,838,198
,, 29	3,827,443	3,149,664	6,977,107

Fixed Issues—Private Banks, £4,570,931; Joint Stock Banks, £3,316,143.

Average amount of Promissory Notes in Circulation in Scotland and Ireland during the Four Weeks ended the 19*th of January, the* 16*th of February, and the* 15*th of March,* 1856.—(*Continued from page* 96.)

Scotland.

Date.	£5 and above.	Under £5.	Total.
1856.	£	£	£
Jan. 19	1,438,782	2,704,000	4,142,789
Feb. 16	1,395,070	2,562,412	3,957,483
Mar. 15	1,338,247	2,481,565	3,819,813

Ireland.

Date.	£5 and above.	Under £5.	Total.
1856.	£	£	£
Jan. 19	3,103,582	3,866,606	6,970,190
Feb. 16	3,131,299	3,721,338	6,852,640
Mar. 15	3,109,376	3,482,135	6,591,513

Fixed Issues—Scotland, £3,087,209; Ireland, £6,354,000.

QUARTERLY JOURNAL

OF THE

STATISTICAL SOCIETY.

SEPTEMBER, 1856.

The Present State of the Mining Industries of the United Kingdom.

By Robert Hunt, Esq., F.R.S., *Keeper of Mining Records, Museum of Practical Geology.*

[Read before the Statistical Society, 18th February, 1856.]

In the Journals of the Statistical Society are to be found several valuable communications, on the mineral produce of some of the great mining districts of the United Kingdom. As, however, there does not appear to have been communicated to the Society any general statement of the entire mineral wealth of these Islands, I am induced to endeavour to supply this want. In my official capacity I have been for some years engaged in collecting all available information on subjects connected with British Mining,—metalliferous, and mineral products generally,—and our metallurgical processes. During the last two years especially, I have been engaged in obtaining statistical information connected with these industries; and the success, which has attended my efforts, must be judged of by the publications on "Mineral Statistics" which have issued from the Mining Record Office in connection with the Museum of Practical Geology.

Since the publications referred to contain merely the bald details of the mineral productions of the different districts of the kingdom for each year, I have thought it would prove interesting—and, I trust, not be without value—to examine, by the aid of the data thus afforded, and such as are obtainable from other sources, the present state of our mining industries, and to advance to the consideration of the future prospects of the nation, in regard to this important source of our national wealth.

The laws regulating the distribution of the metalliferous ores are, notwithstanding the extent to which our exploration of mineral lodes has been carried, and the observations which have necessarily been made upon them, scarcely at all understood. Various theories have been from time to time propounded, some philosophers referring our mineral formations to the influences of subterranean heat, while others have thought they could detect evidences of an electro-

chemical process. The philosopher has, however, usually stood upon the surface of the earth, and in his speculations he has generally been guided by the imperfect observations of men who have never been instructed in any method of observation. Hence he has rarely been in a position which justified his forming any opinion as to the operations which nature had hidden in rocks, to the depth of which he himself had not penetrated.

The hypotheses connected with mineral formations may not appear subjects for the consideration of this society; but I think a few tabulated facts may serve to indicate some *constants* of much value to those who may be induced to launch upon—what has ever been, for want of sufficient data,—the uncertain sea of mining speculation. It is not supposed that the few general facts to which attention is now directed, are to be received as confirmatory of any especial view, they are simply given as *facts*, and it is only by collecting and tabulating such, that we can ever hope to relieve the search for the metalliferous ores from the uncertainty by which it is surrounded, and to escape from those sad examples of misrepresentation, some of which are to be referred to ignorance, but many unhappily to fraud.

In Cornwall and Devonshire, during the year 1854, 111 mines sold copper ores in quantities above 50 tons each. 3,225 tons were sold by smaller mines in quantities varying from 10 to 30 tons. I will select a few of the more productive of those mines, and give, upon the best obtainable information, the *direction* of the lodes producing the metalliferous ores in relation to the *true* North, the kind of rock in which the ore is found, and the distance (*approximate*) of the lode from the junction of the clay, slate, and granite.

Name of Mine.	Produce of Ore in Tons in 1854.	Average Mean Direction of Lodes.	Rock in which worked.	Distance from Junction in Chains.
Devon Great Consols	23,174	E. and W.	Clay-slate	40
Huel Buller.....	12,208	25° S. of W.	Granite and Slate	J.*
Huel Basset.....	8,378	24° S. of W.	Do.	J.
United Mines	11,827	27° S. of W.	Slate and Granite	25
Tresavean	3,990	30° S. of W.	Do.	J.
Carn Brea	6,231	30° S. of W.	Granite	J.
Fowey Consols.....	4,440	E. and W.	Slate	30
Alfred Consols.....	3,712	15° S. of W.	Slate and Greenstone	J.
South Huel Frances	2,783	20° S. of W.	Granite	20
West Caradon.....	4,018	E. and W.	Do.	25
West Basset.....	5,231	18° S. of W.	Slate	J.
Tincroft	3,791	20° S. of W.	Slate and Granite	J.
North Roskear.....	2,216	32° S. of W.	Slate and Greenstone	30
Halamanning	2,508	20° S. of W.	Slate	20
Huel Seton	4,945	15° S. of W.	Do.	70
Botallack	1,453	20° W. of N.	Slate and Greenstone	20
Levant.....	1,589	18° W. of N.	Do.	20

These are selected as a few striking examples of the fact, that nearly all our lasting and profitable copper mines have been in close proximity to the junction of two dissimilar rocks, and that the lodes

* J signifies that the *lode* is chiefly productive along the line of junction.

have a main line of general direction. Immediately around the granite formations of the Constantine mass, and the granite hills of Carn Marth and Carn Brea, are grouped about 100 tin and copper mines, the greater number of which have been especially productive, and all these have a general direction of about 20° S. of W.

Amongst this group may be enumerated the following—and the quantity of ore sold within the periods named is given.

	Ore.	Value.		
	Tons.	£	*s.*	*d.*
Tresavean, 1815 to 1854	234,402	1,383,268	11	6
United Mines, Do.	282,848	1,654,334	4	6
Dolcoath, Do.	240,214	1,347,367	9	0
North Roskear, Do.	145,624	853,102	16	0
South Do. 1821 to 1850	38,904	210,332	8	6
Huel Buller and Beauchamp, 1822 to 1846	65,804	333,871	10	0
Huel Unity, 1815 to 1852	112,410	714,080	13	6
Huel Damsel, 1815 to 1842	34,618	258,497	16	6
Huel Bassett, 1815 to 1854	88,174	607,365	10	6
Huel Gorland, 1815 to 1848, and 1851	41,499	254,808	14	6
Tin Croft, 1815 to 1827, and 1834 to 1854	86,398	363,076	1	6
Cook's Kitchen, 1815 to 1846	45,583	179,627	14	6
Camborne Vean, 1815 to 1826, and Stray Park, 1826 to 1854	60,797	335,729	12	0
Consolidated Mines, 1815 to 1854	435,408	2,845,482	13	0
Huel Jewell, 1815 to 1824, and 1829 to 1853	58,160	400,190	13	6
Huel Maid and Carharrach, 1820 to 1852	33,571	191,460	12	0
Carn Brea Mines, 1833 to 1854	148,983	852,385	3	0
East Huel Crofty, 1832 to 1854	101,952	534,816	12	0

Those mines only have been selected of which a correct return for several years could be obtained. An examination of the district around St. Austle will show that the same conditions prevail. The Liskeard and Callington mines observe similar orders of proximity, and around the edge of the great granite formations of Dartmoor, where the geological conditions are similar to those of Cornwall, productive mines are now developing themselves.

The lead-lodes of Western England are *generally* found at nearly right-angles to the lines of the copper lodes, their run being about N. and S. The lead-lodes of Flintshire have a main run from E. to W., some few of them, however, running from the S. of E. to the N. of W. The lodes of Alston-moor have also an easterly and westerly direction. Of the Cardiganshire mines, which have been worked since the times of the Romans, Mr. Warington Smyth, who has very carefully examined the district, says:—* "The most general strike of the lodes is E.N.E. and W.S.W., a direction so subject to frequent variations for small distances, that some of the minor veins, if drawn in plan on a large scale, would appear to describe a zig-zag line; such being particularly the case when the beds of rock frequently vary in their nature. Nearly all of the most productive deposits agree

* On the Mining District of Cardiganshire and Montgomeryshire. By Warington W. Smyth, M.A., F.G.S. Memoirs of the Geological Survey of Great Britain, and of the Museum of Practical Geology, vol. ii., Part 2.

within a few degrees with this course, as Goginan, Daren, Cwm Symlog, Logaulas, &c.; whilst, among the exceptions, Tre Taliessin, which runs N.W. and S.E., is said to have returned considerable quantities of lead ore, and the 'Comet' lode at Cwm Ystwyth, coursing W.N.W., has within the last few years yielded several thousand tons:—although *only* near its junction with the '*main*' lode, which points E.N.E."

It is true that, in the lead-lodes, the same relation to the lines of junction between dissimilar rocks is not to be detected; but we are not entirely without evidence, which appears to show that some analogous law is equally in operation in those mineral lodes occurring in the stratified districts, as that which so distinguishingly marks the mineral districts of western England.

Mining operations are carried on to a greater or less extent in 21 English counties and the Isle of Man; in 12 Welsh counties, and in 17 counties in Scotland. The following Table, in which the letters indicate the metals found,—C, signifying coal, and Co, copper,—will at one view exhibit the distribution of our mineral wealth.

	Coal.	Iron.	Copper.	Tin.	Lead.	Silver.	Manganese.	Zinc.	Gold.	Antimony.	Nickel and Cobalt.
Cornwall	....	I.	Co.	T.	L.	S.	....	Z.	G.	A.	N. & C.
Devonshire	C.	I.	Co.	T.	L.	S.	M.	Z.	G.	A.	....
Somersetshire	C.	I.	Co.	....	L.	....	M.	Z.	....	....	....
Gloucestershire	C.	I.	....	....	....	..	....	....	....	....	....
Herefordshire	C.	....	....	....	....	....	....	....	....	....	....
Shropshire	C.	I.	....	....	L.	....	....	....	....	....	....
Staffordshire	C.	I.	....	....	....	....	....	....	....	....	....
Worcestershire	C.	I.	....	....	....	....	....	....	....	....	....
Warwickshire	C.	I.	....	....	....	....	M.	....	....	....	....
Northamptonshire	....	I.	....	....	....	....	....	....	....	....	....
Leicestershire	C.	...	Co.	....	L.	....	....	....	....	....	....
Lincolnshire	....	I.	....	....	....	....	....	....	....	....	....
Nottinghamshire	C.	....	....	....	....	....	....	....	....	....	....
Derbyshire	C.	I.	Co.	....	L.	....	....	....	G.	....	....
Cheshire	C.	....	....	....	....	....	....	....	....	....	....
Lancashire	C.	I.	Co.	....	L.	....	....	....	....	....	....
Yorkshire	C.	I.	....	....	L.	S.	....	....	....	....	....
Durham	C.	I.	....	....	L.	S.	....	Z.	....	....	....
Northumberland	C.	I.	....	....	L.	S.	....	....	....	....	....
Cumberland	C.	I.	Co.	....	L.	S.	....	Z.	....	....	N. & C.
Westmoreland	C.	I.	Co.	....	L.	S.	....	....	....	....	....
Isle of Man	....	I.	Co.	....	L.	....	M.	Z.	....	....	....

In this, and the following table, only the localities in which the minerals have been effectively worked are given. Iron, for example, exists in large quantities, in the eastern and south-eastern counties, in the green-sand formations. British iron was at one time made entirely from the green-sand iron-stones, but at present none of this ore is employed in our iron manufactures, if we except a small quantity raised in Dorsetshire. Many of the metals named are known to exist in small quantities in counties in which I have not marked their occurrence.

WALES.

	Coal.	Iron.	Copper.	Tin.	Lead.	Silver.	Manganese.	Zinc.	Gold.	Antimony.	Nickel and Cobalt.
Monmouthshire	C.	I.	....	....	....	....	....	....	....	....	....
Glamorganshire	C.	I.	....	....	L.	S.	....	....	....	....	....
Caermarthenshire	C.	I.	....	....	L.	S.	....	....	G.	....	....
Pembrokeshire	C.	....	....	....	....	....	....	....	....	....	....
Cardiganshire	....	....	Co.	....	L.	S.	....	Z.	....	....	....
Brecknockshire	C.	I.	....	....	....	....	....	....	....	....	....
Montgomeryshire	C.	....	....	....	L.	S.	....	....	....	....	....
Flintshire	C.	I.	....	....	L.	S.	....	Z.	....	....	....
Denbighshire	C.	I.	....	....	L.	S.	....	Z.	....	....	....
Merionethshire	C.	....	Co.	....	L.	S.	....	....	G.	....	....
Caernarvonshire	C.	I.	Co.	....	L.	S.	....	....	....	....	....
Anglesea	C.	I.	Co.	....	....	....	....	....	....	....	....

SCOTLAND.

Dumfriesshire	C.	....	....	....	L.	S.	....	....	....	....	....
Kirkcudbright	....	I.	Co.	....	L.	S.	....	....	....	....	....
Wigtonshire	....	....	....	....	L.	....	....	....	....	....	....
Ayrshire	C.	I.	....	....	....	....	....	....	....	....	....
Renfrewshire	C.	I.	....	....	....	....	....	....	....	....	....
Dumbartonshire	C.	....	....	....	....	....	....	....	....	....	....
Lanarkshire	C.	I.	....	....	L.	S.	....	G.	....	....	....
Stirlingshire	C.	....	....	....	....	....	....	....	....	....	....
Linlithgowshire	C.	I.	....	....	....	....	....	....	....	....	....
Edinburghshire	C.	I.	....	....	....	....	....	....	....	....	....
Peeblesshire	C.	....	....	....	....	....	....	....	....	....	....
Haddingtonshire	C.	....	....	....	....	....	....	....	....	....	....
Fifeshire	C.	I.	....	....	....	....	....	....	....	....	....
Clackmannanshire	C.	....	....	....	....	....	....	....	....	....	....
Perthshire	C.	....	....	....	L.	S.	....	....	....	....	....
Argyleshire	C.	....	....	....	L.	S.	....	....	....	....	N.

IRELAND.

Galway	....	....	....	....	L.	S.	....	....	....	....	....
Queen's County	C.	....	....	....	....	....	....	....	....	....	....
Carlow	C.	....	....	....	....	....	....	....	....	....	....
Kilkenny	C.	....	....	....	....	....	....	....	....	....	....
Wicklow	....	I.	Co.	....	L.	S.	....	....	G.	....	....
Tipperary	C.	....	Co.	....	L.	S.	....	....	....	....	....
Down	....	....	....	....	L.	S.	....	....	....	....	....
Kerry	C.	....	....	....	....	....	....	....	....	....	....
Tyrone	C.	....	....	....	....	....	....	....	....	....	....
Antrim	C.	....	....	....	....	....	....	....	....	....	....
Wexford	....	....	....	....	L.	S.	....	....	....	....	....
Limerick	C.	....	....	....	L.	S.	....	....	....	....	....
Cork	C.	....	Co.	....	L.	S.	....	....	....	....	....
Waterford	C.	I.	Co.	....	....	....	....	....	....	....	....
Clare	C.	....	....	....	L.	S.	....	....	....	....	....
Monaghan	....	....	....	....	L.	S.	....	....	....	....	....

The number of mines at work in the United Kingdom may be stated as follows:—

	England.	Wales.	Scotland.	Ireland.	Total.
Collieries	1,704	306	368	19	2,397
Copper mines	220	12	....	15	247*
Tin do.	130	....	....	....	130†
Lead do.	318	179	14	19	530‡

It has not been possible, from the peculiar condition of iron mining, to give with any exactness the number of mines producing iron in the United Kingdom. Zinc and the other metals, being commonly produced by the lead or copper mines, are omitted from the list, as are the few mines producing the rarer minerals. Having given a general statement of the extent of the mines of this country, it is now important that we should proceed to the examination of each mineral industry in detail.

Tin was probably obtained in this country at as early—if not an earlier—period than any other metal. A paper was communicated to the *Statistical Society*, in 1839, by Mr. Joseph Carne, of Penzance, on the "*Statistics of the Tin Mines of Cornwall, and of the Consumption of Tin in Great Britian.*" This paper enters so fully into the earlier history of the tin trade, that I am relieved from the necessity of enlarging upon it.

Mr. Carne has given a table of the production of tin in Cornwall from 1750 to 1837. In the following table, however, I repeat a portion of this, my object being to show the progress of tin mining during the present century:—

Produce of British Tin Mines since 1800.

Years.	Tons.	Years.	Tons.	Years.	Tons.	Years.	Tons.
1800....	2,522	1814....	2,611	1828....	4,931	1842....	....
1801....	2,365	1815....	2,941	1829....	4,434	1843....	....
1802 .	2,669	1816....	3,348	1830....	4,444	1844....	....
1803....	2,960	1817....	4,121	1831....	4,300	1845....	....
1804....	3,041	1818....	4,066	1832....	4,323	1846....	....
1805....	2,785	1819....	3,315	1833....	4,065	1847....	....
1806....	2,905	1820....	2,990	1834....	2,989	1848....	6,613
1807....	2,465	1821....	3,373	1835....	4,228	1849....	6,952
1808....	2,371	1822....	3,278	1836....	4,054	1850....	6,729
1809....	2,548	1823....	4,213	1837....	4,790	1851....	6,143
1810....	2,036	1824....	5,005	1838....	5,130§	1852....	6,287
1811....	2,385	1825....	4,358	1839....	....	1853....	5,763
1812....	2,373	1826....	4,603	1840....	....	1854....	5,947
1813....	2,324	1827....	5,565	1841....	....	1855....	6,000

* In this number there are included several mines producing but small quantities of copper ore, but those are excluded (perhaps about 50,) which are not producing ore, and which exhibit little prospect of doing so.

† Some of the mines included in this number are producing copper as well as tin. The stream works for tin are not included.

‡ In Derbyshire and in some other counties there are numerous workings producing a few cwt. per annum, in which two or three men only are employed; these are not included in this number.

§ After the Michaelmas quarter of 1838 the coinages ceased, and, consequently, accurate returns could not be obtained for some years; the later returns are obtained from the smelters and other sources, which may be relied on.

The following lists give not merely the produce of all the important tin mines in Cornwall producing tin ore in 1855, but the names of several others from which tin was raised but not sold. The mines are divided into districts for the purpose of indicating their situations.

Penzance District, including St. Just and St. Ives.

No.	Names of Mines.	Quantities of Black Tin.				Value.		
		Tons	cwt.	qrs.	lbs.	£	s.	d.
1	Providence Mines	270	11	3	0	17,895	0	0
2	Balleswidden	252	8	3	27	18,086	18	7
3	Levant	223	10	0	25	14,680	10	0
4	Huel Owles	217	2	0	7	15,744	19	6
5	St. Ives Consols	214	0	1	25	12,840	0	0
6	Boscean	209	10	3	10	14,311	5	9
7	Ding Dong	146	0	0	0	9,809	0	0
8	Botallack	139	15	3	1	9,352	7	10
9	Lewis Mines	104	0	0	0	6,670	0	0
10	East Huel Margaret	99	19	0	19	5,997	0	0
11	Huel Margaret	88	17	0	0	5,323	11	3
12	Spearne Moor	51	9	2	15	3,089	0	0
13	Huel Kitty	39	19	2	4	2,409	0	7
14	Carn Yorth	22	0	0	0	1,480	11	6
15	Lelant	20	0	0	0	1,154	11	1
16	Spearne Consols	7	0	0	0	425	4	0
17	Huel Margery	5	8	1	9	324	0	0
18	North Levant	2	0	0	0	89	7	0
19	Huel Bosorn	1	1	2	24	70	19	8
20	South Providence	4	6	0	13	240	0	0
21	Trelyon Consols							
22	Balleswidden United							
23	Huel Bal							
24	Huel Reeth							
25	Balnoon Consols							
26	East Balleswidden							
27	Mount Tiack							
28	North Ding Dong							
29	Huel Carne							
30	Huel Margery (St. Ives)							
31	Huel Powl	6	10	3	27	413	2	0

Helstone District, including St. Hilary, &c.

No.	Names of Mines.	Quantities of Black Tin.				Value.		
		Tons	cwt.	qrs.	lbs.	£	*s.*	*d.*
1	Great Huel Vor United	229	19	2	21	12,668	0	1
2	Porkellis United	167	8	3	18	9,951	0	9
3	Great Work	149	2	0	2	8,946	0	0
4	Huel Lovell	107	10	2	2	7,407	12	2
5	Wendron Consols	100	0	2	11	5,597	18	6
6	Huel Guskus.....	83	0	2	14	4,980	0	0
7	Huel Enys.....	77	8	2	3	4,384	16	4
8	Leeds and St. Aubyn	42	1	2	19	2,757	3	9
9	Trumpet Consols	40	0	0	0	2,977	2	8
10	East Huel Vor	32	19	2	1	1,814	2	0
11	Great Huel Fortune	30	0	0		1,489	14	5
12	Huel Trevelyan.....	25	9	2	13	1,565	3	1
13	Huel Widden	24	10	3	17	1,816	10	3
14	Trenear Sett (part of Wendron Consols)	17	17	3	14	1,032	3	3
15	Mill Pool	15	14	0	3	1,005	17	2
16	Sundry Stream Works in the Duchy of Cornwall lands, in the manor of Helstone, in Kerrier	6	5	2	2	427	1	8
17	St. Aubyn and Grylls	5	5	0	3	327	10	5
18	Christopher Consols.....	3	0	0	0	151	5	6
19	Wendron United	1	6	0	8	84	4	3
20	South Huel Charlotte	0	16	0	17	52	13	10
21	Wellington Mines.....		.....			.....		
22	East Rosewarne		.....			.....		
23	Polgear and Lancarrow		.....			.....		
24	Sithney Huel Buller.....		.....			.....		
25	Trevoole (Crowan)		.....			.....		
26	Huel Helen		.....			.....		
27	Huel Hender.....		.....			.....		
28	Huel Trevena		.....			.....		
29	Trevenan Mine		.....			.....		

Redruth, Camborne, and St. Agnes District.

No.	Names of Mines.	Quantities of Black Tin.				Value.		
		Tons	cwt.	qrs.	lbs.	£	s.	d.
1	Dolcoath	389	9	0	16	23,367	0	0
2	Polberro	264	13	2	27	16,940	4	9
3	Lewis Mine	104	0	0	0	6,670	0	0
4	Huel Kitty	99	12	2	24	6,281	13	8
5	Condurrow	93	11	0	26	5,613	0	0
6	West Huel Towan	83	19	0	0	8,607	9	9
7	Tincroft	76	16	2	23	4,909	10	7
8	Huel Betsy	63	6	2	22	4,088	9	6
9	Pednandrea	55	3	2	1	3,695	12	7
10	Huel Unity Consols	31	9	3	0	959	0	0
11	Huel Tremayne	30	0	0	0	1,434	15	1
12	Huel Bassett	22	0	2	16	1,382	3	0
13	Huel Unity	21	0	0	0	1,186	14	0
14	St. Day United	20	0	0	0	1,597	16	6
15	South Huel Francis	19	19	2	20	1,271	11	6
16	Budnick Consols	18	5	1	10	1,192	19	1
17	Huel Friendly	16	7	2	14	835	10	10
18	Stray Park	16	0	0	0	987	17	1
19	Huel Jane (Kea)	15	0	0	0	925	17	2
20	Creegbraws	13	0	0	0	710	5	4
21	West Huel Jane	10	12	1	22	656	16	10
22	Trenow Consols	8	0	0	0	407	2	0
23	Leeds Town Consols	7	16	0	3	512	17	5
24	Huel Rock	6	4	1	2	349	5	10
25	Huel Seton	5	0	0	0	308	16	4
26	Turnavore	4	12	0	14	230	6	0
27	Huel Coates	4	6	1	2	240	16	2
28	Trevellas Park, or Beach Stream	4	2	0	26	242	12	2
29	Cligger, or Cleggo, Park Stream	3	9	3	0	220	7	10
30	Trevanance Stream	2	9	3	8	189	3	6
31	North Huel Crofty	2	0	0	0	81	3	6
32	North Bassett	2	0	0	0	108	8	11
33	Perran Park Stream	1	11	0	24	61	17	6
34	Huel Harriet	1	8	2	6	92	14	6
35	West Polberro	1	5	3	9	67	12	8
36	North Huel Unity	1	0	0	0	41	19	4
37	Great Huel Baddern (Kea)	1	0	0	0	46	14	3
38	South Crofty	1	0	0	0	47	4	11
39	West Bassett	0	10	0	0	31	0	0
40	Perran, or Bolenna	0	15	2	4	39	9	8
41	Huel Uny		.....			.....		
42	Cook's Kitchen		.....			.....		
43	East Pool		.....			.....		
44	Trelyon Consols		.....			.....		
45	West Huel Providence		.....			.....		
46	Huel Trefusis		.....			.....		
47	West Providence (St. Erth)		.....			.....		
48	Budnick Consols		.....			.....		
49	Clijah and Wentworth		.....			.....		
50	Gilmar (St. Erth)		.....			.....		
51	Great Huel Busy		.....			.....		
52	Kea Tremayne		.....			.....		
53	Perran St. George		.....			.....		
54	Prince Albert Company		.....			.....		
55	South Condurrow		.....			.....		
56	Huel Nelson		.....			.....		

St. Austle District.

No.	Names of Mines.	Quantities of Black Tin.				Value.		
		Tons	cwt.	qrs.	lbs.	£	*s.*	*d.*
1	Great Polgooth	235	17	3	9	15,465	3	6
2	Boscundle	99	17	0	0	5,991	0	0
3	Great Beam	78	10	2	26	5,444	3	9
4	Rocks and Treverbyn	39	9	2	6	2,737	4	0
5	Great Hewas United	35	16	2	9	2,344	15	10
6	St. Austle Consols	30	0	0	0	1,800	0	0
7	St. Dennis Consols	22	4	2	23	1,334	0	0
8	Union (Roche)	16	0	0	0	1,189	13	3
9	Sundry stream works in the Manor of Treverbyn*	14	12	0	11	1,016	11	3
10	Great Dowgas	13	4	3	20	901	17	5
11	Great Moor Streams	7	13	3	24	581	17	8
12	Huel Virgin	7	5	2	21	548	11	7
13	Carclaze Sett*	7	3	1	22	530	1	0
14	Huel Anna	5	13	0	10	365	10	8
15	Carvath United*	2	0	0	0	135	3	6
16	Tretoil (Bodmin)	2	10	0	0	117	10	0
17	Trebell (Lanivet)	1	17	3	5	114	6	6
18	St. Austle Hill Consols	1	11	3	15	111	16	2
19	Huel Marshall	1	8	2	0	83	19	3
20	Carvath United		.....			.....		
21	Duke of Cornwall		.....			.....		
22	West Fowey Consols		.....			.....		
23	Huel Polmear		.....			.....		
24	Charlestown Mines		.....			.....		
25	Grey Mare		.....			.....		
26	Lower Nine Stones Cleave and Lantern*	0	3	2	7	10	13	3

* These represent the portions of tin ore only, upon which royalties were paid to the Duchy of Cornwall.

Liskeard and Callington District.

No.	Names of Mines.	Quantities of Black Tin.				Value.		
		Tons	cwt.	qrs.	lbs.	£	s.	d.
1	Drake Walls	264	17	0	8	17,748	19	3
2	Phœnix (Linkinhorne)	11	15	0	5	662	19	1
3	St. Dennis Consols	7	0	3	32	464	9	10
4	West Phœnix	6	18	2	3	429	11	2
5	Huel Arthur	5	17	0	12	400	15	10
6	Alturnum Consols	3	14	2	24	205	15	5
7	Huel Mary Consols	1	0	0	0	35	18	0
8	Huel Robins		.....			.....		
9	Fox Tor (Alturnum)		.....			.....		
10	Hawkmoor (Calstock)		.....			.....		

Mr. Carne informs us that the prices paid to the tinner in Cornwall, between the years 1746 and 1788, varied from 60*s.* the cwt. to 72*s.* the cwt. In a Report of a Select Committee of the House of Lords on the state of the British Wool Trade, is a table compiled by Edward Charles Hohler, giving the average prices of several articles, amongst others of Tin, from 1783 to 1828 inclusive. From this table the following extract is made:—

	£	s.	d.			£	s.	d.	
1783.....	4	1	7	per cwt.	1810.....	7	9	8	per cwt.
1789.....	3	10	3	,,	1815.....	7	3	0	,,
1794.....	5	0	3	,,	1820.....	3	15	9	,,
1800.....	5	4	2	,,	1825.....	4	16	6	,,
1805.....	5	15	8	,,					

This does not differ materially from the prices given by Mr. Carne as the prices paid to the tinner in Cornwall; the apparent discrepancies arise from the fact, that the above table is the price of tin in the metal market, therefore we have to add, to the price for tin ore, the cost of bringing it into the metallic state.

The annual value of the tin ore raised in England within the last two or three years has been as follows:—

	Tin Ore Raised.			Average Value per Ton.	Total Value of Ore.
	Tons	cwt.	qrs.	£	£
1853.....	8,866	0	0	68	593,088
1854.....	8,747	0	0	64	559,808
1855.....	8,947	0	0	68	608,396

The value of the metallic tin produced in 1853, when the price varied from 112*l.* to 118*l.* per ton, may be estimated at 700,000*l.* In 1854, the range of prices, not very different from those of the previous year, gives a total value of 690,000*l.* The average prices of 1855 were—

	£	s.	d.
English blocks.....	125	0	0
,, bars.....	126	0	0
,, refined	129	0	0

Table of Tin Imported into, and of British and Foreign Tin Exported from the United Kingdom since 1833.

	Imported.			British Tin Exported.			Foreign Tin Exported.		
	Tons	cwt.	qrs.	Tons	cwt.	qrs.	Tons	cwt.	qrs.
1833	1,756	4	3	1,249	9	1	1,942	9	3
1834	2,338	9	3	467	11	2	2,334	4	3
1835	985	4	2	388	5	0	1,189	15	0
1836	1,161	15	2	558	0	0	861	0	0
1837	1,451	0	0	864	0	0	1,461	0	0
1838	1,536	3	0	1,254	0	0	1,451	0	0
1839	912	0	3	1,465	7	1	1,138	5	2
1840	469	19	3	1,844	4	3	329	13	2
1841	1,421	14	2	1,167	0	1	1,267	4	2
1842	555	11	2	3,088	3	3	620	12	0
1843	1,559	6	1	1,819	16	0	650	7	0
1844	604	5	0	1,110	16	1	957	13	2
1845	1,278	7	2	576	5	3	917	7	1
1846	1,015	5	2	1,195	3	0	1,051	18	2
1847	1,165	0	0	1,741	1	3	573	10	2
1848	299	3	1	1,771	5	3	417	0	2
1849	1,798	2	0	1,764	12	0	446	19	3
1850	1,685	11	0	1,588	1	2	189	15	4
1851	2,587	1	0	1,011	0	0	245	9	0
1852	2,372	2	3	941	12	0	433	3	0
1853	2,487	0	1	1,277	0	0	1,072	10	0
1854	2,251	1	0	1,405	14	0	668	16	0
1855	1,612	7	0	1,337	14	0	280	0	0

From this table will be apparent the quantity of foreign tin re-exported and that retained for home consumption. The principal importations of tin of late years have been from the following countries:—

	1844.	1845.	1846.	1847.	1848.	1849.	1850.	1851.	1852.	1853.	1854.	Total.
	Tons.	Tons.	Tons	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Singapore	427	938	517	636	136	1,145	636	805	750	1,555	1,158	8,303
Java	128	102	48	36	....	....	....	....	....	....	1	315
Siam	40	10	....	....	....	....	....	....	....	....	....	50
East India Company's territories	3	97	198	125	7	294	347	459	225	548	438	2,738
Holland.....	4	43	158	15	73	104	433	952	1,307	587	391	4,567
Peru	....	11	....	4	18	17	20	70	12	73	23	248
China.....	....	....	87	344	14	195	15	2	15	98	228	998
Van Diemen's Land	....	....	....	1	....	....	....	....	....	....	....	1
Belgium.....	....	....	....	....	26	....	....	....	....	....	....	26
Spain	....	....	....	....	21	31	115	54	....	....	....	221
PortPhillip ...	....	....	....	....	....	....	9	....	....	....	8	17
United States	....	....	....	....	....	....	79	178	....	....	....	257

The existence of tin in Australia and Van Diemen's Land is a fact of considerable interest. The tin which has been forwarded to this country from Victoria, contains a considerable quantity of gold, which has induced those engaged in metallurgical operations to urge

upon the "diggers" who may not have been so successful as they desired in their search for gold, to look after the less valuable metal.

For a considerable period there has not been a discovery of any new locality in this country for tin. The Cornish stream works are not so productive as they were, and the mines producing tin are being worked at a constantly increasing cost. In the meantime the demand for tin in our white metal manufactures is rapidly increasing. We may, therefore, fairly expect that the stanniferous produce of our colonies is destined to meet the increasing demand for this rare and valuable metal.

The paper by Sir Charles Lemon on the "Statistics of the Copper Mines of Cornwall," published in the Journal of the Society in June, 1838, renders it unnecessary that I should trouble the Society with any of the matters connected with the early history of copper mining. These have been very fully treated of by one who is thoroughly familiar with all that concerns the county which he represents in Parliament. With the view, however, of showing the progress which has been made in copper mining, I have compiled the following brief table:—

The Produce of the Copper Mines of Cornwall from the Year 1725, *in Periods of Ten Years.*

	Tons of Ore.	Average Price per Ton.	Amount Realized.
		£ s. d.	£
From 1725 to 1735.....	64,800	7 15 10	473,500
,, 1735 to 1745.....	75,520	7 8 6	560,106
,, 1745 to 1755.....	98,790	7 8 0	731,457
,, 1755 to 1765.....	169,699	7 6 6	1,243,045
,, 1765 to 1775.....	264,273	6 14 6	1,778,337
,, 1775 to 1785.....	304,133	6 3 0	1,827,106
,, 1785 to 1795*	....	....	..
,, 1795 to 1800.....	249,834	8 9 6	2,177,724†

The produce of copper ore has been given by Sir Charles Lemon to the end of 1837. Commencing from that date, the following may be received as an exact statement of the progress of this especial mineral industry. The accounts are made up to the 30th of June in each year specified.

* The produce of the mines for the years 1789 to 1794 cannot be obtained, but the quantities of copper ore sold in the other years of the period were as follows:—

	Tons.	Amount.
		£
1786.....	39,895	237,237
1787.....	38,047	190,738
1788.....	31,541	150,303
1794.....	42,815	320,875
1795.....	43,589	326,189

† This includes the last five years of the last century only.

Date.	Number of Mines Selling Ore at Ticketings.*	Total of Ore Sold.				Fine Copper in Ore.				Money Value.			Standard.		
		Tons, 21 cwt.	cwt.	qrs.	lbs.	Tons, 21 cwt.	cwt.	qrs.	lbs.	£	s.	d.	£	s.	d.
1838	76	145,688	20	0	0	11,527	4	1	17	857,779	11	0	109	3	0
1839	79	159,551	0	0	0	12,450	18	1	24	932,297	12	6	110	2	0
1840	79	147,266	0	0	0	11,037	16	3	1	792,758	3	6	108	10	0
1841	79	135,090	0	0	0	9,987	2	1	23	819,949	2	0	119	6	0
1842	70	135,581	0	0	0	9,896	3	0	15	822,870	12	0	120	16	0
1843	64	144,806	0	0	0	10,926	1	0	6	804,445	19	0	110	1	0
1844	68	152,667	0	0	0	11,246	14	1	20	815,246	9	6	109	17	0
1845	77	157,000	0	0	0	12,239	2	3	11	835,358	19	6	103	10	0
1846	88	158,913	0	0	0	12,447	16	1	16	886,785	1	6	106	8	0
1847	92	148,674	0	0	0	11,966	8	0	18	830,739	9	0	103	12	0
1848	90	155,616	0	0	0	12,869	19	1	16	825,080	2	6	97	7	0
1849	89	144,938	0	0	0	12,052	17	3	23	716,917	7	0	92	11	0
1850	72	150,890	0	0	0	11,824	0	1	21	814,037	3	0	103	19	0
1851	76	154,299	0	0	0	12,199	16	1	15	808,244	1	6	101	0	0
1852	82	152,802	0	0	0	11,706	16	3	20	828,057	19	6	106	12	0
1853	94	180,095	0	0	0	11,839	14	0	0	1,124,561	2	0	136	16	0
1854	96	180,687	0	0	0	11,779	14	0	0	1,153,756	3	6	140	2	0
1855	106	188,969	0	0	0	12,241	18	0	0	1,212,686	8	0	141	10	0

I have for some years obtained the annual produce of the copper mines for each particular year made up to the end of December. Without this statement it might appear that some discrepancy existed between the returns now given and those published in the "*Memoirs of the Geological Survey of Great Britain.*" There may be some advantage in giving the sales from our Cornish copper mines for each particular year; these may be regarded as close to the truth, the private contract sales having been unimportant.

	Ore.	Copper.				Value.		
	Tons.	Tons	cwt.	qrs.	lbs.	£	s.	d.
1848.....	147,701	12,241	19	2	5	720,090	17	0
1849.....	146,326	11,683	13	0	22	763,614	19	0
1850.....	155,025	12,253	10	2	21	840,410	16	0
1851.....	150,380	11,807	8	2	18	782,947	8	6
1852.....	165,593	11,776	17	2	24	975,975	14	0
1853.....	181,944	11,913	12	0	12	1,155,167	3	6
1854.....	184,858	11,979	4	2	21	1,192,696	12	6
1855.....	195,193	12,578	11	0	23	1,263,739	6	0

In neither of the tables given have the quantities of copper ore bought by private contract by the great copper smelting firms been included. As it is not always easy to obtain information in detail of these purchases, and consequently to separate British from Foreign ores, it is thought advisable to make a separate statement of the private contract purchases after the tables of English, Irish, and Foreign copper ores. The earliest accounts of the Swansea sales

* Sundry small mines selling under ten tons are not included in this number.

which I have been enabled to obtain are from 1804, when first the copper sales were published in the *Cambrian* newspaper. The publication of the printed ticketing papers commenced in 1839. As these returns show a very remarkable extension of the copper trade of Swansea, the amount sold for each year is given.

Copper Ores sold at Swansea from the Year 1804 *to* 1847.

Date.	English.	Welsh.	Irish.	Foreign.
	Tons.	Tons.	Tons.	Tons.
1804	....	52	....	....
1805	....	....	....	....
1806	....	41	62	....
1807	....	68	810	....
1808	....	312	1,391	....
1809	....	240	530	....
1810	....	400	603	....
1811	....	88	68	....
1812	....	622	120	....
1813	....	442	213	....
1814	....	321	429	....
1815	77	1,079	700	....
1816	35	600	673	....
1817	....	422	9	....
1818	317	247	349	....
1819	1,796	90	1,531	....
1820	1,408	124	2,200	....
1821	957	191	2,040	....
1822	521	412	1,923	....
1823	633	564	3,673	....
1824	436	358	4,471	....
1825	2,061	1,191	5,350	....
1826	505	1,115	4,271	....
1827	508	1,140	7,383	....
1828	320	3,555	8,510	199
1829	720	6,076	7,044	668
1830	415	1,788	9,115	934
1831	540	1,442	9,707	975
1832	646	3,184	11,399	641
1833	361	1,786	11,293	1,059
1834	377	3,336	17,280	2,077
1835	268	3,770	22,123	6,758
1836	535	1,698	21,013	9,046
1837	179	2,216	22,306	14,521
1838	964	3,410	22,161	19,868
1839	1,812	2,637	23,613	24,092
1840	752	1,525	20,166	35,354
1841	705	1,180	14,321	41,364
1842	1,910	857	15,253	44,392
1843	756	1,133	17,600	40,739
1844	430	700	20,063	45,491
1845	622	1,914	19,647	46,643
1846	549	1,035	17,553	39,348
1847	406	340	14,373	35,700

The great advance in the quantities of copper ores from Ireland, shows the advantage of a better system of mining in that country

than such as had been previously practised. Improvements are still required: there is no doubt but that the mineral resources of Ireland are of the highest order, they only wait further development.

The quantity of foreign copper ores imported has been steadily increasing. The largest quantities have been produced in the following localities.

Previously to 1848, the total quantities sold at Swansea, of which any returns can be obtained, were as follows:—

Cobre	172,634 tons of 21 cwt.	St. Jose in Cobre	8,246 tons of 21 cwt.
Chili	82,580 ,,	Burra Burra	5,389 ,,
Cuba	36,033 ,,	Kapunda	2,354 ,,
Santiago	57,230 ,,	Bacuranco	1,112 ,,
Copiapo	14,887 ,,	Cobija	1,798 ,,
Valparaiso	9,306 ,,	Pennsylvania	1,454 ,,
Norway	8,357 ,,		

From that year to the end of 1854 the quantities of ore sold at Swansea have been as follows:—

From the Foreign Mines.

Name.	1848.	1849.	1850.	1851.	1852.	1853.	1854.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Cobre	17,564	19,409	5,905	14,724	11,106	9,141	12,804
Chili	3,398	213	662	421	....	407	311
Burra Burra	4,047	7,238	3,405	829	....	550	....
Cuba	7,486	2,697	4,548	2,955	3,799	3,829	3,110
Copiapo	765	710	875	406	892	796	1,070
Kepunda	661	213	949	868	889	893	732
Santiago	716	1,518	1,119	2,036	1,272	789	785
Recompensa	460	....	....	....	....	....	....
Giburra	....	151	....	....	....	....	....
Kanmantoo	321	....	....	....	169	....	....
Cabral	....	96	87	....	....	....	....
Montacute	93	....	....	....	....	....	....
New Zealand	....	....	....	96	....	....	....
Parniga	82	....	....	....	....	....	....
Havannah	....	209	....	161	....	302	....
Adelaide	33	....	135	48	....	....	....
Australian	40	....	....	65	113	....	102
Cantabra	43	....	....	....	....	....	....
Carridad	20	....	....	....	....	....	....
Kaw-aw	....	307	853	961	209	104	....
West Kaw-aw	....	....	....	423	64	....	....

It is necessary to name a few importations which are not included in the table. Amongst the sales we find—

In 1853.—Montreal	893 tons.		In 1854.—Peninsular	1,449 tons.	
,, Spanish ore	535 ,,		,, African	378 ,,	
,, Malaga	547 ,,		,, Spanish ore	687 ,,	
,, New Zealand	160 ,,		,, Montreal	362 ,,	
,, Algiers	205 ,,		,, Algiers	139 ,,	
,, Carthage	205 ,,		,, South African	32 ,,	

These returns exhibit in a curious manner the development of mining industries in several new countries, which promise to furnish us eventually with large supplies of copper ore. The Australian diggers will, without doubt, when the gold fever has declined, discover that they have, hidden in their rocks, treasures to be developed by healthful industry, in the shape of metalliferous ores, which will prove to them far more valuable than the auriferous deposits of their gold-fields.

Since 1847, the following Irish mines have sold copper ore at Swansea:—

Name.	1848.	1849.	1850.	1851.	1852.	1853.	1854.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Bearhaven	5,872	5,812	6,137	6,969	5,692	5,868	5,030
Knockmahon	4,674	2,787	....	3,624	3,471	3,373	4,421
Holyford	302	....	....	....	89	499	555
Ballymurtagh	1,449	1,059	370	104	556	455	1,237
Lackamore	152	114	101	204	140	....	159
Cronebane	137	....	13	....	25	121	50
Gurtnadyne	....	....	154	....	....	....	....
Ballinoe	....	....	59	97	....	....	....
Tigrony	....	....	13	....	....	....	....
Connorree	....	....	....	....	22	40	....
Galway	....	....	....	....	....	54	....
Cosheen	....	....	....	....	....	....	45
Total quantities of ores sold in each year from the Irish mines by public ticketings at Swansea	12,586	9,772	6,847	10,998	9,995	10,410	11,505

There are a few private contract purchases in addition to those, and some ores, but not any considerable quantities, have been sold from English and Welsh mines. From Wales there was sold copper ore, in 1854, to the amount of 287 tons, the value of which was 2,011*l.* This was the produce of nine mines. The mines of Devonshire sold at Swansea 789 tons, mostly in small quantities. The Coniston mines, Greenbourn, and Laxey, sold 3,252 tons; of this 3,048 tons were from Coniston, the value of which was 26,611*l.*

The total quantities of copper smelted in this country since 1850, have been as follows, the quantities bought in Cornwall, at Swansea, and by private contract, being distinguished:—

	Cornwall.		Swansea.		Private Contract.		Total.	
	Tons	cwt.	Tons	cwt.	Tons	cwt.	Tons	cwt.
1850.....	12,253	10	7,108	8	4,506	6	23,868	4
1851.....	11,807	8	6,015	0	4,974	1	22,796	9
1852.....	11,776	17	4,901	18	3,836	7	20,515	2
1853.....	11,913	12	4,559	0	5,874	16	22,348	8
1854.....	11,964	12	4,726	19	5,426	3	22,117	14
1855.....	12,578	11	5,926	1	7,440	12	25,945	4

The production of copper in this country during last year, therefore, shows a large increase.

During those five years the exportation of British and foreign copper was as follows:—

	British.			Foreign.*			
	Tons	cwt	qrs.	Tons	cwt.	qrs.	lbs.
1850.....	21,307	12	2	1,001	4	3	7
1851.....	17,555	11	0	1,428	4	0	0
1852.....	16,936	1	0	1,357	9	0	0
1853.....	15,632	7	0	1,706	18	0	0
1854.....	13,678	5	0	1,822	0	0	0

The total imports of copper ore and regulus for the same period were—

	Ore.			Regulus.			
	Tons	cwt.	qrs.	Tons	cwt.	qrs.	lbs.
1850.....	40,388	5	3	5,473	12	1	26
1851.....	35,683	18	0	6,442	5	2	11
1852.....	37,817	12	2	5,226	0	1	21
1853†	45,285	19	1	5,107	4	0	15
1854.....	50,904	12	24	6,351	4	0	26

* This does not include foreign manufactured copper, which is entered in the returns by value.

† The duty on copper ore was repealed on the 4th of June, 1853.

[The remainder of Mr. Hunt's paper, treating of the yield of British mines in lead, iron, and other metals, and of the produce of our collieries, is unavoidably postponed till the next number of the Statistical Journal.]

On the Mortality arising from Military Operations. By William Barwick Hodge, *Fellow of the Statistical Society of London and of the Institute of Actuaries.*

[Read before the Statistical Society, 21st April, 1856.]

The present paper may be considered a sequel to that upon the "Mortality arising from Naval operations"* which I had the honour to lay before the Society in their last Session.

Although military affairs are in general looked upon in England with less interest than those of the navy, they derive at this time increased importance from the fact that nearly all the great operations of the present war have been upon land, and have, moreover, from a combination of unfortunate circumstances, been subjected to much criticism and discussion.

The war itself being so recent, the numerical facts relating to it are too little known and authenticated to admit of their being employed to any great extent in this inquiry; and the data for the present paper have, therefore, as in that upon naval operations, been principally drawn from the events of the great revolutionary wars, beginning in 1793, although advantage has been taken of such accurate information as could be procured relating to other periods.

The difficulty of such researches proves strongly how desirable it is that full official reports of the statistics of the present war should be laid before the world; and the recent announcement that the Government does not intend to publish the large collection of facts upon the subject made by one of the Crimean Commissioners, a Fellow of this Society, whose qualifications for the task are so well known, is therefore greatly to be regretted.

It is said, indeed, that although the reports are to be confined to official circles, the public service will have the full benefit of them; but this, I venture to say, is a great mistake. The full benefit to be derived from information of this description can only be obtained by laying it open to the whole nation, so that every enquirer may be at liberty to sift and examine it, and to point out the conclusions to which he may consider it to lead.

A due regard to the feelings and anxieties of those whose relatives or friends are serving against the enemy, would seem to dictate the promulgation of more regular and precise information as to the deaths which take place at the seat of war. The publication of the nominal returns of the killed and wounded among the private soldiers now adopted, I believe, for the first time, was no doubt prompted by the consideration referred to; but the intention would be more completely carried out by inserting in the Gazette, in addition to the returns of killed and wounded, monthly lists of the deaths which take place in the military hospitals abroad. If the whole of these returns were regularly transmitted to the Registrar-General, the

* *Statistical Journal*, vol. xviii.

public would be certain, from the admirable manner in which the statistics of his department are managed, to have full and precise information upon questions of great importance both to the nation and to individuals. Such an arrangement would likewise remedy a defect in the Registration Act pointed out by the Registrar-General himself in his return for the quarter ending December, 1854. "The Act," he says, "has made no provision for the registration of the officers and soldiers of the army who die out of England, so that, while the name, age, rank or profession, place, time, and cause of the death of every man, woman, or child that dies at home are preserved in the Registers, the names of the men who uphold in arms the cause and the fame of their country abroad, find no place in these records. Otherwise every family that has sent forth its sons, and has lost them in the war, would have the satisfaction of knowing that their names were inscribed in a perpetual record whether they died at Varna, perished at Scutari, sank under the waves of the inhospitable sea, or slumbered at Alma, Balaklava, or Inkermann, beneath the earth of the Crimea consecrated only by their bravery."

There seems to be a general impression that the experience acquired by recent disasters, will lead to such a permanent improvement as to preclude the possibility of their recurrence; but the student of our military history will find too many subjects for humiliation and anxiety to join readily in such a belief. The voice of experience, if it could have averted those calamities, has spoken loudly and distinctly enough, but with such slight effect, that much of the language of complaint and remonstrance uttered during the last two centuries may be applied with hardly the alteration of a syllable to the present times. "We English," said Marshal Schomberg, in 1689, "have stomach enough for fighting, it is a pity we are not as fond of some other parts of a soldier's business."* One hundred and twenty years afterwards, on the 17th of June, 1809, the Duke of Wellington wrote†—"We are an excellent army on parade, an excellent one to fight, but we are worse than an enemy in a country, and take my word for it, that either defeat or success would dissolve us."

The historian of the English sieges in the Peninsula, Sir J. T. Jones,‡ assigns as a reason for the heavy losses they occasioned, that the armies being unprovided with a sufficient number of skilled engineers, were in most cases unable to push their approaches close enough to the body of the place besieged, and the troops, therefore, in marching to the assault, were compelled to leave the protection of the trenches at such a distance from the point to be attacked, that, before reaching it, they were broken and thrown into confusion by the fire of the enemy and the obstacles to be overcome.§ The Duke of Wellington, in his grief for the carnage at Badajoz, complained bitterly of this defect.

Sir John Pringle, writing one hundred years ago, said‖—"Among the chief causes of sickness and mortality in an army, the reader will

* Macaulay's Hist. of England, vol. iii., p. 430.
† Despatches, vol. iv., p. 407.
‡ Journal of Sieges in Spain.—Introduction, p. xvi.
§ Despatches, vol. ix., p. 181. ‖ Diseases of the Army.—Introduction.

little expect that I should rank what was intended for its health and preservation, the hospitals themselves—and that on account of the bad air and other inconveniences attending them." Sir James McGrigor, in 1815,* admitted the truth of the assertion, and pointed out the precautions necessary to prevent the evil.

Admiral Berkeley, who commanded on the Lisbon station, writing to Earl Temple, on the 10th of September, 1809, said, in reference to the army in the Peninsula,—"The horses starved while ships loaded with hay and oats from England, enough to furnish all the cavalry, were rotting and spoiling in the Tagus. The medical-staff is as bad, as our army were dying away from want of medicines, while more than sufficient were in ships in the river."†

The medical men at Walcheren complained that when they were in want of wine and porter for the sick, application was made to the Senior Deputy-Commissary-General to purchase these articles, but he refused to do so.‡

In the same expedition, much distress, and consequent sickness, arose from the want of cooking places. The importance of attention to this subject was urged by Sir James McGrigor, yet a large proportion of the sickness in the Crimea was caused by neglect of it.§

Insufficient clothing was another cause of serious disease among the troops there. "The best clothed were generally among the most healthy regiments," was the warning of Sir James McGrigor, in 1815;‖ and Lord Wellington's opinion upon the point, may be inferred from the following extract of a letter he wrote to General Fane, dated 3rd November, 1810:¶—"I wish I had it in my power to give you well-clothed troops, or to hang those who ought to have given them their clothing."

These painful reminiscences are not brought forward with a view to throw blame upon any one, still less to create an impression that evils of such magnitude do not admit of a remedy, but simply to show that the information in official hands, which must be infinitely more extensive than any here cited, has failed in suggesting one; and to enforce the opinion that the best hope of success will be found in the fullest and most extensive circulation of correct intelligence as to the evils themselves and their causes.

In most professions the importance of classifying and studying the results of experience for the purpose of deducing therefrom rules for future guidance, is fully recognized and acted upon; but in the military and naval services it seems to be but partially understood, although in them of infinitely greater moment, because in many cases officers have no opportunities for acquiring practical experience until they are placed in situations where errors may lead to the most disastrous and fatal results.

There are undoubtedly some exceptions to the second of these remarks, and among them are Sir John Pringle and Sir James McGrigor, to whose observations I have already referred. The

* Medico-Chirurgical Transactions, vol. vi., p. 474.
† Court and Cabinet of Geo. III., vol. iii., p. 359.
‡ Parliamentary Papers, p. 646. § Ibid., p. 162.
‖ Medico-Chirurgical Transactions, vol. vi., p. 468.
¶ Despatches, vol. vi., p. 550.

works of the former are familiar to everyone who has paid attention to the subject. Sir James McGrigor, well known for many years as Director-General of the Army Medical Board, was at the head of the medical department of the Peninsular army during the latter part of the war, at the conclusion of which he wrote a sketch of the medical history of those campaigns in which he had served. This sketch was printed in the sixth volume of the "Transactions of the Medico-Chirurgical Society" (pp. 381 to 490), and appears to have been read before the Society on the same day as Sir Gilbert Blane's celebrated "Statements of the Comparative Health of the Navy." It contains many valuable suggestions as to the preservation of the health of troops on service, and some important statistical returns, which have been found useful in determining points that would otherwise have been left in doubt.

Mr. Guthrie, who served in the Medical Department throughout the Peninsular War, and whose humanity and professional enthusiasm induced him to devote several weeks to gratuitous attendance on the soldiers wounded at Waterloo, has published in his "Commentaries on the Surgery of the War in Portugal," &c. (sixth edition, London, 1855), some comparative tables. In 1838, Mr. Rutherford Alcock published* "Notes on the Medical History and Statistics of the British Legion in Spain," with which he served as Deputy-Inspector-General of Hospitals.

General Stewart appended to his "Sketches of the Services of the Highland Regiments" (Edinburgh, 1822), returns of the casualties suffered in each regiment during the period of its service, and a complete list of the killed and wounded in the British Army from the beginning of the war in Spain and Portugal to the end of the campaign in the Netherlands. A collection of Parliamentary Papers, published in 1811 (London, 8vo.), contains full information as to the losses and sickness among the troops employed in the expedition to the Scheldt, better known in England as the expedition to Walcheren. Of all the contributions, however, to this department of knowledge, the most valuable by far, in a statistical point of view, is to be found in the second volume of the "Lancet" for 1837-1838, pp. 143 to 148, in a paper "On the Mortality and Sickness of Soldiers engaged in War," by Mr. T. R. Edmonds, a Fellow of this Society, well known by his scientific writings upon vital statistics. Mr. Edmonds enjoyed the unusual advantage of access to the whole of the returns in the Adjutant-General's office, and obtained from them "a full detail of the total loss experienced in the Peninsular Army subsequently to Christmas, 1810."

"I considered," he says, "that the knowledge of the particulars of this loss would suffice to afford a correct idea of the destructive effect on life and health, produced by a vigorously prosecuted war, on an army generally victorious and rarely suffering from disastrous retreats." Mr. Edmonds has, I think, been led into erroneous conclusions upon some points, but his general results are invaluable; being, so far I know, the only systematic collection upon a large scale of numerical results relating to the present subject.

In the paper upon "Naval Mortality," allusion was made to an

* London, Churchill, 1838.

article in the "Companion to the Almanack for 1853," entitled "Cost of War" (p. 53), which gave, in chronological order, lists of the losses sustained by the British in all engagements, whether by sea or land, which took place from 1793 to 1815. Having tested the accuracy of more than three-fourths of the numbers relating to the army, including particularly those which refer to operations of magnitude, I have found them almost invariably correct; and I have therefore adopted them, with some slight additions and alterations, as the basis of Table II. in the appendix. This table contains the total numbers returned as killed and wounded, in each year, from 1793 to 1815, distinguishing the officers from the non-commissioned officers, and rank and file, with columns, showing the average effective strength of each class. The effective strengths of the latter were deduced from the returns of the Adjutant-General, printed in the Appendices to the Journals of the House of Commons.

The difficulties experienced in the Naval enquiry, arising from the almost entire absence of official information, do not exist with respect to the army. Among the parliamentary papers there is a vast mass of returns containing such copious and extensive information, that it is truly surprising no English author, either historical or professional, should have availed himself of them. M. Dupin, in his "Force Militaire de la Grande Bretagne" (part 1), published some statistical tables, derived from these returns, to show the state of the British Army during the war, from 1804 to 1813; but, from his not being aware of the corrections necessary to be applied, his results are inaccurate. Some portions of his tables were republished in "Marshall's Military Miscellany" (London, 1846), a valuable work, containing much information as to recruiting, and particularly as to military punishments.

The Adjutant-General's returns show, periodically, the effective strength of the cavalry and infantry of the army; the numbers of the deaths, discharges, and desertions, and of the recruits annually raised; but they only contain occasionally information as to the Artillery and Engineers, those troops having been, until very recently, under the separate control of the Ordnance Department. The returns of effective strength give the numbers of rank and file only without non-commissioned officers, who are, however, included in the returns of deaths, discharges, and desertions. In order, therefore, to compare these with the effective strength, it is necessary that a proportionate increase should be made to the latter. This fact, which I only learned through the courtesy of the present Adjutant-General, does not appear upon the face of the returns, and is one of the sources of the errors of M. Dupin.

In the British Army, the non-commissioned officers are corporals and serjeant-majors, serjeants, armourers, saddlers, trumpet, drum and pipe majors, trumpeters, drummers, fifers, and pipers; and from a comparison of the numbers in the Army Estimates, for two years, they appear to average very nearly 72 to every 1,000 rank and file upon the establishment, or number of men voted by Parliament. The corporals are included in the rank and file, of whom they form about one-twentieth part. In all the statements of effective strength in the present paper, the numbers shown by the returns have

been increased in the ratio of 1,072 to 1,000 for non-commissioned officers.

The returns from 1793 to 1800 give the effective strength at the beginning of the year only, and the average numbers for those years are the means of the numbers at the commencement and termination of each year. For the subsequent years, however, the returns are given for the first January and first July in each year; and the averages adopted are the means of the numbers at the beginning, middle, and end of each year. In a body which fluctuates so much as an army, it would certainly be more desirable to have monthly records of the strength. No returns of the effective strength of the Artillery and Engineers, previously to 1801, have been published; and it has therefore been necessary to form an estimate of the numbers of these corps, from 1793 to 1800, from the numbers of men annually voted for them.

Only one set of returns relating to the commissioned officers actually serving has been discovered. These* are dated the 11th of May, 1814, and may be supposed to give the actual numbers at the commencement of that year. From it has been drawn out the following

Abstract of Return showing the Total Number of Officers of all Ranks actually serving in the British Army (including Artillery and Engineers), 11th May, 1814.

Ranks.	On Full Pay.			On Half Pay.
	Numbers.	Proportion of each Rank to a Total of 100,000 Officers.	Proportion of each Rank to the Effective Strength of 100,000 Non-Commissioned Officers and Rank and File.	
General Officers—				
Field-Marshals, Generals, Lieutenant, and Major-Generals ...	344	2,507	121	120
Field Officers—				
Colonels, Lieutenant-Colonels, and Majors	1,330	9,694	467	181
Captains.....	2,876	20,962	1,009	462
Subalterns—				
Lieutenants (1st and 2nd) Sub-Lieutenants, Cornets, and Ensigns	6,630	48,324	2,327	1,268
Adjutants, Paymasters, Quartermasters, and Recruiting Service	986	7,187	346	515
Medical	1,176	8,571	411	188
Chaplains, Commissariat, and Provost-Marshals	378	2,755	133	235
Total	13,720	100,000	4,814	2,969

A comparison of this abstract with the effective strength in non-

* Commons' Journals, 1814, p. 643.

commissioned officers and rank and file at the same period, gives for each 1,000 of these a proportion of 48 officers nearly. The numbers in the first column of Table II., headed "Estimated average effective strength" of commissioned officers, were deduced in this ratio from the strength of the non-commissioned officers, and privates, shown in the opposite column.

This proportion of officers is greater than upon active service, when there are generally about 40 officers to every 1,000 non-commissioned officers and rank and file, but as the percentage of sickness is always much larger among the men, the relative numbers adopted probably represent the amount of risk to each class in battle.

In order to determine with precision the total mortality caused by casualties in action, it is necessary to ascertain the proportion of those returned as "wounded" who die subsequently of their wounds. Some observations upon this subject occur in the paper on "Naval Mortality,"* previous to which no attempt had been made to investigate the question generally, except by Mr. Edmonds in his paper in "The Lancet," already referred to, where he has given a table extracted from the returns submitted to him, shewing the number of officers who died of wounds after five great battles.

From this table it appeared that the number dying of wounds was one-third of the number of those returned as "killed," and concluding that this was the general proportion both for officers and private soldiers, he framed his calculations as to the relative mortality from battle and disease accordingly; but there is strong evidence to show that his hypothesis is incorrect as to both classes.

In the Appendix number V. will be found a table constructed from various returns of officers killed and wounded, and of the numbers of the latter who died of their wounds. These returns were taken from General Stewart's "Sketches of the Highland Regiments;" from Mr. Alcock's work on the "Auxiliary Legion;" from Mr. Edmonds' table already mentioned; and from a statement of "Casualties in the Crimea," returned to the House of Commons by the Adjutant-General on the 7th of April, 1855, and said to have been made up to the latest date, which was probably about the 20th of March. The aggregate casualties, recorded in this table, amount to 406 officers killed, and 1,973 wounded, of the latter of whom 164 died; and it will be seen that neither the general average accords with Mr. Edmonds' rule, nor any of the subordinate collections of facts, except that from which it was deduced. The number of officers killed in the Auxiliary Legion was 20, and those dying of wounds was 16, or four-fifths of the killed. In the Crimea, the number killed was 91, and those dying of wounds 20, or less than two-ninths of the killed. One very remarkable circumstance may be noticed with respect to this table, that where the number killed bears a larger proportion to the number wounded than ordinary, the deaths among the wounded are relatively less, and conversely where the number killed is small in proportion to the number wounded, the deaths among the latter are relatively greater—there appearing to be a tendency in all the groups of cases towards a uniform ratio between the total deaths and total casualties, although there are great varia-

* *Statistical Journal*, vol. xviii., p. 202.

tions as to the proportion of injuries immediately fatal and of those that prove fatal subsequently.

As this table records the results of 1,973 cases, equal to more than two-fifths of the whole number of officers wounded from 1793 to 1815, it may be supposed to represent the average deaths with tolerable accuracy, and these being in the proportion of 83·1 per 1,000, or 1 in 12·08, it has been assumed that one-twelfth of the officers returned as wounded died of their wounds.

No official returns as to the mortality among the wounded non-commissioned officers and rank and file have been published by the Adjutant-General; but Sir James McGrigor recorded the causes of all the deaths which took place in the Peninsula while he was at the head of the Medical Department.* The total number is 16,970, and having classified them, I find that 3,411 deaths were caused by wounds and injuries. During the period in question, the numbers returned as wounded were 1,817 officers, and 24,360 non-commissioned officers and rank and file. Deducting for the deaths among the former 151, being one-twelfth, the ratio already given, we obtain 3,361 as the deaths among the latter, which number bears a proportion to the total wounded of 137 per 1,000, or 1 in 7·25. From the mode in which Sir James' returns were made up, it is possible that some deaths from accidents not occurring in action may have been included in his lists. It has, therefore, been thought advisable to take 1 in 8 as the proportion of deaths among wounded non-commissioned officers and rank and file, and this agrees nearly with the result recorded by Mr. Alcock as to the Auxiliary Legion (page 9), in which the deaths among those returned as wounded were 1 in 7. "The proportion," he says, "would have been lower had the full number of the wounded been known; but many men who received slight hurts did not report themselves," not having the same motive for doing so as in the British service.

Although there have been no returns illustrating this part of the subject from the Adjutant-General's Office, a published Report from the Head of the Medical Department in the Crimea, dated the 17th of October, 1855, gave the results of the attack upon the Redan fort at Sebastopol, on the 8th of September preceding. It appears that 1,910 wounded were received into the hospitals upon that occasion, and of these 226, or 1 in 8·79, had died on the 16th of October, 37 days afterwards. There were then 556 cases under treatment, some of which would probably terminate fatally; and as it is stated that a few of the worst had been left upon the ground, there seems reason to think that the total deaths would approximate very nearly to one-eighth of the whole number wounded.

In his "Commentaries," Mr. Guthrie has given, at page 154, the numbers of the wounded admitted into the hospitals after the battle of Toulouse, and of those that died; but as his account falls short of the whole number wounded in the battle, it has not been included in the general result given in Table V.

The disproportion between the estimated deaths of wounded officers (one-twelfth) and those of wounded soldiers (one eighth), being an increase of 50 per cent. for the latter class, is very great,

* Medico-Chirurgical Transactions, vol. vi., p. 479.

but it seems completely established by the following comparative statement drawn from all the distinct accounts upon the subject that have been published.

Proportion of Deaths to 1,000 *Wounded.*

	Siege of Gibraltar. Drinkwater.	Battle of Toulouse. Guthrie.	Auxiliary Legion. Alcock.	As estimated in the present Paper.
Officers	29	26	81	83
Non-commissioned Officers and Rank and File	101	118	142	125

That the difference is due to the greater amount of attention and of comforts that the officer by his position is enabled to secure, appears from the facts relating to the siege of Gibraltar and the battle of Toulouse. At the former, officers were as favourably situated as it is possible to be during actual hostilities, except for a short time when there was a scarcity of provisions, and of 35 that were wounded only 1 died, a mortality very little more than one-third of that in the field. The battle of Toulouse was fought, immediately before the cessation of hostilities, close to a large city, which afforded ample accommodation for the wounded, and out of 117 officers brought to the hospitals there only 3 died, being 1 in 39, or a less proportion than at Gibraltar.

The common men appear also, though in a less degree, to have participated in the advantages, particularly at Gibraltar where, as only 1,083 men where wounded in the course of three years and upwards, the hospitals were probably never crowded, and the deaths among the wounded were reduced to 1 in 10. I have dwelt more upon these facts because they appear to me to lead to the conclusion, that by improved hospital management many more lives of wounded men might be saved.

A further difficulty in determining the mortality from casualties arises from the number of men returned as missing. These may have consisted of soldiers who took advantage of the confusion of a general action to desert; of those wounded or unwounded who fell as prisoners into the hands of the enemy; or of those who having been killed, or so severely wounded as to be unable to move, remained undiscovered in woods, or among standing-corn, or brush-wood, some of them, it is to be feared, dying a lingering death. It is not at all uncommon for a successful army to lose some of its men as prisoners, and it so happened occasionally to the British in the Peninsula; but, looking at the general nature of their operations, it seems probable that a large proportion of those returned as missing, were either killed or wounded; and as nearly all of the latter not carried off by the enemy must have died, there can be little doubt the mortality among the missing was considerable. It has been estimated as being at least one-fourth of the whole number, by a General-Officer of much experience who served on the staff through the greater part of the Peninsular War.

Sir William Napier says, that, at the battle of Albuera, "The trophies of the French were 500 unwounded prisoners," but the number returned as missing out of the British force, which did not form one-fourth of the army, was 570.

The first return of the loss of the Coldstream Guards at the battle of Inkermann, was 9 rank and file killed, and 53 missing; but a corrected return, subsequently published, reported 59 rank and file killed, and none missing. If the army had been compelled to move from its position immediately after the battle, there can be no doubt that a large portion of those killed would have been permanently recorded as missing.

A summary of the losses in twelve general actions gives a result of 4,935 killed, and 25,855 wounded, in all 30,700 ascertained casualties. Taking those dying of wounds at one-eighth of the wounded, the total deaths would amount to 8,167. The numbers returned as missing in these engagements were together 2,752, and the assumption that one-half of these were casualties, and one-fourth of them deaths, would increase the total of the former to 32,076, and of the latter to 8,855, being an addition to the mortality of nearly 85 per 1,000 or $8\frac{1}{2}$ per cent.

In an attempt to deduce from the facts in Table II. the total mortality from casualties in action, the following assumptions have been made, founded upon the considerations just detailed:—

1. That one-twelfth of the officers returned as wounded died of their wounds.

2. That the proportion similarly dying among non-commissioned officers and rank and file was one-eighth.

3. That the mortality in the latter class was increased $8\frac{1}{2}$ per cent., or in the ratio of 1,085 to 1,000 by deaths among the missing, and that the casualties among the missing were double the number of such additional deaths.

No increase of the loss among officers has been made for the missing, very few being so returned.

The Table numbered I. in the Appendix was compiled entirely from the returns made by the Adjutant-General. If these had been complete and accurate, they would have afforded invaluable information; but unfortunately they are incorrect for some of the years, and not being made up in accordance with one general principle, they either mislead the enquirer, or inflict on him much irksome and unnecessary labour in the endeavour to arrange them for the purpose of comparison. Notwithstanding these defects, some interesting and important conclusions may be deduced from them. They relate only to the Cavalry and Infantry of the army, the Artillery and Engineers, for reasons that have been mentioned, not being included in them. The first three columns of the Table show the average effective strength in non-commissioned officers and rank and file in each year, from 1793 to 1815, distinguishing from the year 1800 to the end of the term the respective proportions serving at home and abroad. As the original returns give the rank and file only, the numbers have been increased for non-commissioned officers in the manner pointed out with respect to Table II. The remaining columns record the deaths, discharges, and desertions, with the totals of these, being the

diminution in each year, and the number of recruits annually raised, or the fund out of which the diminution was replaced.

Neither the last, however, nor the column of discharges can be relied upon for showing the real facts, as it was the practice with regard to such men as were transferred by drafts from one regiment to another, to return them from the former as discharged, and from the latter as enlisted. In the list of recruits from 1803 to 1815, the men raised for Foreign and Colonial corps are said not to be included; and although this is not distinctly stated to be the case as to the preceding years, a careful comparison of the numbers for those years with the effective strength leads to the conclusion that it must be so. An exception is, however, to be made for the years 1794 and 1795. The effective strengths for those years are stated to contain, in addition to our own army, the Foreign Corps serving abroad,* in British pay, under the command of the Duke of York, amounting to more than 20,000 men; and there can be no doubt from the large numbers of recruits returned in 1794 and 1795, in all 79,026, and of discharges for 1795 and 1796, together 40,639, that these corps, which must not be confounded with the foreign regiments regularly retained in the British service, were included in the respective lists. I experienced great difficulty in getting access to the returns from 1793 to 1800, they are, I believe, only to be found complete in the Library of the House of Commons, where, through the introduction of Mr. John Benjamin Smith, and the courtesy of the Librarian, I had an opportunity of examining them. They were published in the Annual Register for 1800, but with several typographical errors, the deaths in 1794 being stated at 10,000 too many, and those in 1795 at 10,000 too few, and without the explanations necessary for understanding them correctly. Sir Archibald Alison has quoted from this source the numbers of recruits raised from 1793 to 1800 at 208,388, and compared them with the then existing population of the empire, to show the inefficient exertions made for carrying on the war. The same numbers were also referred to in Parliament by the Secretary at War in a debate, in the year 1854, upon the recruiting of the army; and it is a remarkable proof of our want of a sound system of military statistics, that neither the historian who commented upon these returns with a view to influence our future policy, nor the minister who detailed them to the legislature with a similar purpose, appear to have had any suspicion of their inaccuracy, or of the probability that very little more than three-fourths of the numbers they represent were actually raised as recruits, within these Islands, for the cavalry and infantry of the regular army during the period referred to.

The returns, in this Table I., are arranged in four distinct classes:—1st, from 1793 to 1801, the duration of the first period of the war; 2ndly, for 1802, a year of peace; 3rdly, from 1803 to 1812; and 4thly, from 1813 to 1815. The 3rd and 4th comprise the second and third periods of the war, but the returns for 1813, 1814, and 1815, are classed separately on account of their being incomplete.

The returns from 1793 to 1800 are deficient as regards the

* Commons' Journals, 1806.—Appendix, No. 12.

desertions, none of which are given for these years; and the only period that can be relied upon to furnish materials for accurate ratios as to mortality, discharges, and desertions, is that from 1803 to 1812. During these 10 years, all of which were years of war, it appears that the average strength of the cavalry and infantry, exclusive of commissioned officers, was 198,200 men; that the deaths throughout the army, at home and abroad, were in the annual proportion of 51·25 to 1,000 average strength, or exactly $5\frac{1}{8}$ per cent.; that the discharges, including transfers, were annually 22·51 per 1,000, which should probably be reduced, in respect of the latter, to 20·25 per 1,000; and that the annual desertions were 28·06 per 1,000, making a total average decrement of 99·56 per 1,000, or within a fraction of 10 per cent., exclusive of the losses arising from soldiers who were made prisoners of war.

Notwithstanding the great difficulty of the undertaking, arising from the numerous omissions in the returns, I have endeavoured to estimate, as nearly as the materials accessible permit, the actual number of men who entered into the regular military service of this country during the whole of the periods we have been considering, and likewise the numbers that were removed from it, as well as their several modes of exit.

I have endeavoured to supply the omissions in the returns of deaths, discharges, and desertions, by a comparison of the effective strength with the respective ratios for years that may be relied upon for accuracy, and to correct the returns for discharges by deducting a proportional allowance for transfers from one regiment to another. This allowance I have taken at 10 per cent. upon the annual discharges, after eliminating those for the foreign corps spoken of in reference to the years 1794 and 1795, and those for the years 1802, 1814, and 1815, which took place in consequence of peace having been declared. This deduction amounts to 10,891 men, and the numbers of the recruits are reduced to the same extent. I have likewise estimated that 20,000 men were made prisoners of war. That this number does not greatly exceed the truth, will probably be inferred from the following note appended by the Adjutant-General to a return of "deaths, discharges, and desertions" from 1803 to 1812.*

"There were about 4,000 men left at various places in Spain and Portugal, in the year 1808, by the army under the late Lieutenant-General Sir John Moore, who were struck off the strength of their respective regiments on the 25th of December, 1809, *as no information could be obtained respecting them*, and about 2,800, chiefly belonging to corps in the Peninsula, supposed to be prisoners of war, who were struck off the strength of their respective regiments on the 25th of December, 1811, and in the year 1812, about 2,500 were taken prisoners, not any of whom are included in the above return."

Having estimated the probable numbers of those who disappeared from the army, and knowing the number of recruits raised in the United Kingdom, we may, by comparing them with the effective strengths at the commencement and termination of the period,

* Commons' Journals, 1814.—Appendix, No. 5.

obtain an approximation to the number of men raised for foreign and colonial corps, which I have estimated at 198,630.

There appears to be only one return of the recruits raised for these corps. It is for 1812,* and gives the following numbers for the whole of that year:—

Recruits enlisted at foreign depôts	5,240
At the head quarters of the different regiments	6,087
	11,327

The only information as to the Artillery and Engineers is to be found in the annual returns of effective strength, and the following statement of the numbers of recruits raised in each of 5 years.†

1801	1,175
1802	281
1803	5,882
1804	4,029
1805	3,103
Total	14,470

There seems to be good reason to believe that the mortality in the artillery and engineers is less than in the cavalry and infantry, and it has therefore been taken at one-fifth, or 20 per cent. lower, and the discharges are estimated at a like reduction after an allowance for the regimental transfers, which cannot occur in the artillery. The desertions are assumed to have been in the same proportion as for the cavalry and infantry, it being supposed that the high rate of bounty, the great temptation to desert, applied equally to every branch of the service.

A comparison of all these elements with the average effective strength has given the results inserted in Table I. The total numbers in that Table, actually taken from the returns, are deaths 198,781; discharges 224,149; desertions 84,255; total 507,185; recruits raised 501,609. The following is submitted, with very great diffidence, as an approximation to the real numbers for the whole period from 1793 to 1815.

* Commons' Journals, 1814.—Appendix, No. 5.

† Ibid., 1806.—Appendix, No. 12.

Estimate of the Number of Men that entered into and were removed from the Regular Army from 1793 *to* 1815.—See Appendix, Table I.

	Total Numbers.	Proportion to a Total of 100,000.		Total Numbers.	Proportion to a Total of 100,000.
Of Recruits raised—					
For British Regiments	519,040	69,421	Deaths	219,420	37,710
For Foreign and Colonial Regiments	198,630	26,567	Discharges	229,141	39,378
Total	717,670	95,988	Desertions	113,273	19,475
Of Foreign Corps temporarily employed	30,000	4,012	Prisoners of War	20,000	3,437
	747,670	100,000		581,834	100,000
Effective strength on the 1st Jan., 1793 (Non-com. officers and rank and file)	45,440		Effective strength on the 31st Dec., 1815 (Non-com. officers and rank and file)	211,276	
	793,110			793,110	

If the foregoing be a correct estimate, the numbers of recruits annually raised throughout the period were,

For British regiments of cavalry, infantry, artillery, and engineers	22,567
For foreign and colonial regiments	8,636
	31,203

The modes by which a very large portion of the men were raised are shown in a return from the Adjutant-General of the total recruiting for British (exclusive of foreign and colonial) regiments for a period of ten years and nine months, ending with September, 1813.*

	Gross Numbers.	Proportion to a Total of 100,000.
By ordinary recruiting	134,316	53,760
Under the Additional Force Act	15,790	6,315
By volunteering from the Militia	99,755	39,925
	249,861	100,000

It may be interesting to some enquirers to compare the foregoing with the progress of recruiting during the present war.

According to a return from the Adjutant-General's Office, dated the 2nd of April, 1855, the numbers of recruits raised for the

* Commons' Journals, 1813.—Appendix, No. 5.

different branches of the army, from the 1st of March, 1854, to the 31st of March, 1855, were—*

	Total Numbers.	Annual Ratio.
Cavalry	4,106	3,790
Infantry	40,289	37,190
Artillery	4,755	4,389
Total	49,150	45,369

The numbers volunteering from the militia are not fully stated in the return, and the proportion contributed by that force cannot, therefore, be determined; nor is it mentioned whether recruits for foreign corps are included. The Act authorizing the employment of these was passed on the 23rd of December, 1854, and the highest number of recruits (6600) was enlisted in that month, after which the enlistments fell off considerably, probably from the accounts which reached England of the deplorable state of the army in the Crimea. In February, 1855, only 4073 men were enrolled.

In order to give in one view the general results of the facts contained in the Tables I. and II., now described, the following three statements have been drawn up.

The first, taken from Table II., is

(A.)

A Summary of the Casualties in Action sustained by the British Regular Army during $20\frac{45}{100}$ *Years of Hostilities occurring in and between* 1793 *and* 1815.

	Officers.			Non-Commissioned Officers and Rank and File.		
Average Strength	9,078			189,500		
	Killed.	Wounded.	Total.	Killed.	Wounded.	Total.
Total Casualties	920	4,685	5,605	15,392	65,393	80,785
Estimated deaths among the wounded	390	$= \frac{1}{12}$		8,174	$= \frac{1}{8}$	
Estimated casualties among the missing	....	....	....	23,566 2,003		4,006
Total Deaths	1,310			25,569	Total Casualties	84,791
Annual proportion of deaths to 1,000 strength	7·06			6·60		
Annual ratio of casualties to 1,000 strength	30·19			21·88		

* 4th Report Crimean Committee.—Appendix, No. 14.

The next, deduced from the deaths recorded in Table I., is

(B.)

A Statement of the Annual Ratio to 1,000 *Mean Strength of the Mortality during War among the Non-Commissioned Officers and Rank and File of the Cavalry and Infantry of the British Army, as shown by the Adjutant-General's Return.* 1793 *to* 1801—1803 *to* 1812.

Year.	Ratio of Total Mortality.			Ratio of Mortality from Casualties in Action.
	British Corps.	Foreign and Colonial Corps.	Whole Force.	
1793.....	Not known.	Not known.	29·63	3·26
1794.....			80·98	6·36
1795.....			93·69	1·27
1796.....			84·78	2·46
1797.....			53·65	0·38
1798.....			34·32	0·31
1799.....			36·93	6·17
1801.....			49·97	4·89
1803.....	41·77	39·30	41·47	3·22
1804.....	38·70	60·50	41·76	0·54
1805.....	40·38	36·77	39·81	1·39
1806.....	35·96	27·12	34·39	1·01
1807.....	39·13	39·62	39·24	3·88
1808.....	43·58	32·96	41·74	1·43
1809.....	76·19	45·06	71·27	7·71
1810.....	63·03	48·90	60·40	1·67
1811.....	63·70	39·08	58·80	9·08
1812.....	72·11	50·11	67·38	10·76
Average....	53·23	42·15	53·65	4·04
	1803 to 1812			
Additions for deaths among those returned as missing			0·34	0·34
			53·99	4·38
			Whole Period.	

Finally, by combining the tables (I. and II.) with information already published, we obtain

A Comparative View of the Mortality of the Military and Naval Services.

Annual Proportion to 1,000 Effective Strength.	During War.							During Peace.		
	Army.						Navy, 1793 to 1815.	Army.		Navy, 1830 to 1843.
	At Home and Abroad, 1793 to 1815.		Abroad, 1803 to 1812.		On Active Service, Peninsula, 1811 to 1814.			At Home, Various Periods.	Abroad, Various Periods.	
	Officers.	Non-Commissioned Officers and Rank and File.	Officers.	Non-Commissioned Officers and Rank and File.	Officers.	Non-Commissioned Officers and Rank and File.	Officers, Petty Officers, and Common Men.	Non-Commissioned Officers and Rank and File.	Non-Commissioned Officers and Rank and File.	Officers, Petty Officers, and Common Men.
those inured in action	30·19	21·91	48·02	30·16	287·00	182·00	8·62	....	....	....
deaths from injuries in action	7·06	6·60	11·50	9·40	65·00	52·32	3·00	....	....	....
from shipwreck	Not known	49·61	Not known	70·64	36·00	112·78	6·00	15·90	35·80	15·97
from diseases accidents							32·00			
Total Deaths	....	56·21	....	80·04	101·00	165·10	41·00	15·90	35·80	15·97

The annual deaths in the army, during peace,* are 15·90 per 1,000 for the troops serving at home, and 35·8 per 1,000 for those serving abroad, the average for the whole being about 29 per 1,000; but it appears from the following table, that during the war, the deaths in the army at home were in rather a larger proportion. The average, from 1801 to 1805, being 18·41, instead of 15·9, per 1,000, a difference which may have arisen from the return to the depôts of their regiments of men debilitated by the hardships of active service.

Army at Home. (*Cavalry and Infantry only.*)

Year.	Average Strength.	Total Deaths.	Ratio of Deaths to 1,000 Average Strength.
1801	81,000	1,816	22·42
1802	67,400	1,254	18·61
1803	76,860	1,228	15·99
1804	97,800	2,116	21·64
1805	103,800	1,445	13·92
Annual Average	85,400	1,571	18·41

* *Statistical Journal*, vol. viii., p. 197.

The statement (B) contains the annual ratio of mortality among the cavalry and infantry from 1793 to 1812, beyond which it could not be carried because there were no accurate returns of the general mortality for the years 1813, 1814, and 1815. This is greatly to be lamented, as the military operations in those years, particularly in 1813, were much more actively carried on than before.

In this statement the annual proportions of death from casualties in action are shown in a separate column, by means of which some valuable comparisons may be made.

The average annual ratio is exceedingly low, being only 4·38 per 1,000, including an addition of 0·34 per 1,000 for deaths among the missing not included in the returns that served as the basis of Table I. (Appendix), from which the statement (B) was deduced.

This low ratio arises from the fact, that of the 25,569 deaths from casualties shown in the statement (A), only 14,282, or less than four-sevenths of the whole, occurred previously to the end of 1812. Between this period and the conclusion of the war the remaining 11,287 deaths took place, the average per 1,000, for each of the years not included in statement (B), being as follows:—

1813	.....	16·49 per 1,000
1814	.....	8·67 ,,
1815	.....	15·08 ,,

very high ratios as compared with the preceding period; and particularly so, when it is considered that there were not twenty-seven months of actual hostilities, and very little more than eighteen months of European war during the three years.

The great increase, subsequently to 1812, brings the annual average ratio of deaths from casualties in action to 6·60 per 1,000 (Statement A).

The annual ratio of mortality from disease may be obtained by deducting the annual ratio of deaths in action from the annual ratio of deaths from all causes. It was (53·99 − 4·38 =) 49·61 per 1,000 from 1793 to 1812.

Having no guide for the amount of mortality from disease after 1812, we can only assume that it is represented by the average ratio up to the end of that year, and by adding to this the average deaths from casualties during the whole period, we get (49·61 + 6·60 =) 56·21 as the annual ratio of mortality from all causes from 1793 to 1815.

The total mortality of the troops upon active service (Statement C) was taken from Mr. Edmonds' tables, with an addition of 4·10 per 1,000 annually for deaths among those returned as missing, which increases the ratio of deaths from all causes from 161 to 165·1 per 1,000 per annum.

Besides this alteration, the proportions of the deaths caused in battle, and of those caused by disease, are differently stated.

Mr. Edmonds having ascertained from the returns the total deaths from all causes, during the period he examined, deducted therefrom, for the purpose of determining the deaths from disease, the numbers returned as killed increased by one-third, which he considered would be a proper allowance for the numbers that died

of wounds; but it has already been shown that this allowance was insufficient, and Mr. Edmonds has consequently over-estimated the mortality from disease, and under-estimated that from casualties in action. The following comparison will show how Mr. Edmonds' results, and my own, were arrived at:—

Mortality from Various Causes in the Army under the Duke of Wellington for 41 Months ending 25th May, 1814.

Rank.	Officers.		Non-Commissioned Officers and Rank and File.	
Average strength	2,716		61,511	
	Killed.	Wounded.	Killed.	Wounded.
Total numbers	399	2,208	6,335	30,221
Died of wounds	184	= $\frac{1}{12}$	3,778	= $\frac{1}{8}$
	583		10,133	
Died from Disease	357		23,696	
			33,829	
Correction for deaths among the missing	....		861	
	940		34,690	
Mr. Edmonds.				
Total numbers killed	424		6,674	
Died of wounds	142		2,225	
	566		8,899	
Died from Disease	374		24,930	
	940		33,829	

The total numbers of deaths do not appear to be so much influenced, as might be expected, by the numbers of those that took place in action, there being often a high rate of general mortality when the deaths in action were very few, and on the contrary, a much smaller amount of total mortality when the deaths in action were more numerous. One result appears, however, always to have followed—namely, that when the deaths in action in a given year were many, the mortality from disease in the succeeding year was high, although the deaths in action in that year may have been few in number. This increase of mortality was no doubt caused by the diseases engendered in the preceding year by the hardships of active service.

M. Dupin, in his "Force Militaire de la Grande Bretagne" (I. page 243), has stated the mortality of the British, exclusive of the foreign and colonial corps, at 59·30 per 1,000, or very nearly 6 per cent.; but, as has been pointed out, he was not aware of the necessity for making an allowance for non-commissioned officers, and therefore

his estimate is beyond the truth; nevertheless he expresses surprise at not finding it greater.*

His opinion of our military system was thus expressed:—"If we reflect upon the various means employed by the English Government to supply the wants of the soldier, and upon the prudence of its military chiefs, who never strain the powers of man beyond the just limits of his efforts, and his privations, we shall cease to be astonished at the trifling losses of the British army."

In the statement (B) a distinction is made, from 1803 to 1812, between the mortality of the British corps and that of the foreign and colonial corps. They were respectively 53.23 and 42·15 per 1,000 annually, the mortality of foreign and colonial corps being about 20 per cent. less than the British. This result agrees in a very remarkable manner with the conclusions pointed out by Dr. Balfour as to the superior healthiness of all troops when serving in their native countries.† The real difference is greater than it appears, because a larger portion of the foreign and colonial corps were employed out of the United Kingdom upon services so much more fatal to British soldiers as to increase the mortality among them from below 20 to 80 per 1,000 annually.

The following statement shows the proportion of cavalry and infantry serving at home and abroad from the year 1808 to 1812, both inclusive:—

Serving.	Gross Numbers.			Ratio to 1,000 Strength.		
	British.	Foreign and Colonial.	Whole Force.	British.	Foreign and Colonial.	Whole Force.
At home....	80,000	5,700	85,700	430	131	374
Abroad	105,900	37,900	143,800	570	869	626
Total	185,900	43,600	229,500	1,000	1,000	1,000

It may be said, indeed, that the relative mortality of the British was increased from their exposing themselves more fearlessly in battle; but although this may have been occasionally the case, the foreign troops in our pay gave many proofs of distinguished gallantry, and the Duke of Wellington frequently spoke of them in very high terms. The objection, however, is of no value as, if the whole of the casualties in action had fallen upon the purely British regiments, the mortality from disease among them would still have exceeded the

* There are other mistakes in M. Dupin's statements, for instance, he has inserted (I. 241) for the years 1813 and 1814, under the head of British Corps, the Total Deaths returned by the Adjutant-General, which include foreign and colonial corps. The returns, themselves, however, for the years in question, are so defective that probably the mistake of the author brought him nearer the truth. A very important typographical error occurs in the table referred to, where the discharges (*congés*) from the army for 1814 are stated at 3,429 instead of 34,293, the number also being placed in a wrong column. The discharges for that year were, British corps 25,867, foreign and colonial corps 8,426; total, 34,293.

† *Statistical Journal*, vol. viii., p. 197.

total mortality of the foreign and colonial corps. It has been recently stated in Parliament that the desertions among these troops were greater than those among the native British regiments, but the contrary is shown to have been the case by the returns of the Adjutant-General.

The following is an abstract of these from 1803 to 1812, inclusive, for the non-commissioned officers and rank and file of the cavalry and infantry only :—

	Gross Numbers.			Ratio to 1,000 Strength.		
	British Corps.	Foreign and Colonial Corps.	Whole Force.	British Corps.	Foreign and Colonial Corps.	Whole Force.
Deaths	86,700	14,877	101,577	53·23	42·15	51·25
Discharges....	35,541	9,074	44,615	21·82	25·71	22·51
Desertions	46,666	8,948	55,614	28·65	25·35	28·06
Total	168,907	32,899	201,806	103·70	93·21	101·82
Average Strength	162,900	35,300	198,200	1·000	1·000	1·000

The fact that the great bulk of the foreign and colonial troops were employed abroad, accounts no doubt for the diminished ratio of desertions, as by far the larger proportions of these took place among the troops serving in the United Kingdom.

From the facts that have been detailed we may form some estimate of the actual loss of life caused to this Empire by the wars beginning in 1793.

The strength of the British army at the commencement of that year was 45,440 men, exclusive of officers, and it was 211,276 men at the termination of the year 1815, in which peace was finally concluded. This large force was kept up at the latter date because a considerable corps was employed with the army of occupation in France, but in more recent times our army has seldom exceeded 120,000 or 130,000 men while there was peace in Europe, and we can hardly suppose that its average strength, from 1793 to 1815, would have exceeded 80,000 men if there had been no war during that period. An average force of 189,500 men was, however, rendered necessary by the war, and it therefore caused an increase equal to 109,500 men constantly employed.

The total estimated deaths from 1793 to 1815 were 219,420 (page 232), and from these are to be deducted the deaths that would probably have occurred, during peace, in a regular army of 80,000 men, and among the excess of 109,500 men who, but for the war, would have remained in the employments of civil life.

According to Dr. Farr's English Life Table,* 10 per 1,000 is the annual ratio of deaths for the whole male population of the age of

* Registrar-General's Annual Report, 1844, p. 520

30. Assuming this to have been the average age of the 109,500 men referred to, the annual deaths among them, as civilians, would have been 1,095, or for twenty-three years 25,185. The annual ratio of deaths in the whole army, at home and abroad, is 30 per 1,000, at which rate there would be 55,200 deaths in twenty-three years, in an average force of 80,000 men. The sum of the deaths in the two classes, or 80,385, deducted from the total estimated deaths, or 219,420, leaves 139,035 as the excess of mortality caused by the war.

Besides these, 2,003 deaths, not included in the returns as such, are estimated to have taken place among the missing; these must be added to the foregoing result, together with 1,310 officers killed in action, and such a proportion of the deaths among officers from disease, as exceeded the ordinary mortality during peace.

We have no means of ascertaining with accuracy what this was, but it can hardly have been at a less rate than 7 per 1,000 annually, which, on a mean strength of 9,078, would amount to 1,460 deaths in twenty-three years.

The total account of extraordinary mortality, according to these data, would stand thus :—

Non-Commissioned Officers and Rank and File.

Deaths included in the Adjutant General's returns corrected for omissions		219,420
Add for deaths among the missing		2,003
Total		221,423
Deduct estimated peace mortality		80,385
		141,038

Commissioned Officers.

Killed in action	1,310	
Estimated excess of mortality from disease	1,460	
		2,770
Total estimated excess caused by War		143,808

A similar calculation having been made respecting the mortality in the navy* during the same period, the two may be compared with advantage.

* *Statistical Journal*, vol. xviii., p. 213.

General Summary of the extraordinary Mortality caused among all Ranks in the Army and Navy by $20\frac{45}{100}$ *Years of Actual Hostilities occurring in and between* 1793 *and* 1815.*

Excess of Mortality beyond the ordinary rates during Peace caused by	Total Numbers.		Proportion in 100,000 Deaths	
	Army.	Navy.	Army.	Navy.
Casualties in action	26,879	6,663	18,686	10,524
Shipwreck*	116,929	11,985	81,314	18,931
Diseases and accidents		44,662		70,545
Total	143,808	63,310	100,000	100,000
	207,118			
Average strength in officers and men	198,578	110,000		

The total number of 207,118 spread over a period of twenty-three years, gives an annual excess of 9,005 deaths, but probably not less than 23,000 out of the whole, or about 1,000 per annum, occurred among the foreign and colonial corps. So that the actual loss of life to the inhabitants of these Islands, in consequence of the direct action of the war, appears not to have been greater than 8,000 annually.

It is likely that some addition should be made to this estimate for extra mortality among prisoners of war, consisting not only of men taken in the active service of the army and navy, but of civilians belonging to the mercantile marine, many of whom were captured.

All these classes must have been placed in a position unfavourable to health. According to Alison† there were, in the year 1811, about 10,000 English prisoners in France, and 50,000 French prisoners in England.

If we consider the slight apparent effect upon the productive powers of this country of the enormous mortality occasioned by the cholera, the still greater destruction that followed the famine in Ireland, and the immense emigration amounting, in the fifteen years ending with 1854, to 3,133,414‡ persons, most of them belonging to the classes from which the army and navy are recruited, we shall be convinced that the power of this Empire to make war upon a large scale is not likely to fail from the want of men.

* There can be no doubt that British soldiers, from the extensive service required of them in our transmarine possessions, are liable to considerable losses from shipwreck; and in our own time we have seen them meet its horrors with the same undaunted fortitude with which they confront the dangers more properly arising from their profession. There is, however, no information to show the proportion of deaths arising from this cause; the whole are included in the deaths from disease and accidents.

† History of Europe, vol. ix., p. 682.

‡ Statistical Abstract, 1830-1854, published by command of Her Majesty.

Napoleon* estimated that a population of a million of souls will furnish annually 3,500 recruits, and as the average number of the inhabitants of the United Kingdom, from 1793 to 1815, was about sixteen or seventeen millions, it is clear, on this supposition, that the direct mortality caused by its warlike operations could have been supplied by a fraction of the people.

These facts lead to the reflection that the slaughter occasioned by warfare is not among the greatest of its evils, and that the most extensive of these, apart from moral and religious considerations, are probably to be found in the various forms of social misery it creates by the interruption of productive industry and commercial communications. Such at least is the case in countries that have not, like our own, been fortunate enough to escape the scourge of its actual presence. We cannot calculate the suffering it inflicts upon these, but we are not without the means of partially estimating its effects.

In the able article upon Vital Statistics, published in McCulloch's account of the British Empire, it is mentioned that the civil war in Sweden, which lasted during the five years from 1806 to 1810, "caused the annual mortality to rise 25 per cent.; and the effect was felt, not only by the able-bodied men engaged in warfare, but by the old man, the young woman, and the child upon the mother's breast."†

The inhabitants of Spain and Portugal were about 16,000,000 during the war of independence, and from the nature of the contest, and the bitter animosity they showed against the invaders, it is hardly possible that the evils produced could have been less, indeed they were probably much greater, than those of the war in Sweden just referred to.

Assuming the ordinary annual mortality of those countries to be 25 per 1,000, an increase of 25 per cent. would amount to 6·25 per 1,000, which, in the six years the struggle lasted, would have caused an excess of 600,000 deaths, probably not less than three times the number that occurred in all the foreign armies that contended upon the soil.

A very striking fact shown by these statements is one that has already been noticed by Mr. Edmonds‡—namely, that the casualties occurring to officers are much greater in proportion than those happening to the lower ranks. Upon active service the annual casualties of officers were 287 per 1,000, and of men only 182 per 1,000, being a difference of more than 50 per cent. against the former. Among a given number of casualties, however, the proportion of officers killed outright is smaller than among the men, being 164 per 1,000 for the former, and 193 per 1,000 for the latter. This may probably be accounted for by the circumstance that the most destructive wounds in battle are inflicted by round and grape shot, which are generally discharged at bodies of men, and cannot, except in very rare instances, be directed against particular individuals. With respect to these, the men are exposed to the same risks as the officers, and the excess of casualties, from which the

* Mémoires, vol. viii., p. 6. † Vol. ii., p. 561.

‡ Lancet, 1837-8, ii., p. 145.

latter suffer, are no doubt produced by their becoming especial objects of individual riflemen or musketeers.

Sir Howard Douglas* quotes, on the authority of M. Arago, a statement made by Col. Lebeau, who commanded the 1st regiment of French infantry of the line at the battle of Waterloo, to the effect that the officers of his regiment were all, without exception, wounded by the English riflemen, whose balls he called "*balles d'officiers*" because they disdained to aim at the common men; the same able writer gives an account of the havoc created among the Danish officers in the battle of Idstedt, fought in 1850, by a body of Prussian riflemen, armed with *carabines à tige*, and posted behind a hedge at 150 yards distance from the Danish line.† It seems probable that the risks to officers will increase with the improvement in small arms.

From what has been already stated, it appears that the proportion of deaths among wounded officers, compared with those among wounded men, are in the ratio of 2 to 3 only. So that although the risk of injury in battle to the officer is so much greater than to the private soldier, being as 3 to 2, the ultimate risk of death from the same cause is not so much in excess, being only as 13 to 10; but when the mortality from disease is included in the estimate, the relative chances of death are reversed, and become to the soldier 8 to 5 as compared with the officer.

It is necessary to bear in mind, however, that these proportions refer only to the gross numbers of each class serving with the army, and not to the numbers actually present in battle. During the Peninsular war, an average of one-fifth of the private soldiers were disabled by sickness, and a considerable number detached for the performance of special duties, being described in the returns as on command. The diminution in the numbers of the officers present in action, from the same causes, was very much less, although we cannot determine the proportion, the numbers of officers so situated not being stated in the returns.

Mr. Edmonds, indeed, says, in reference to this part of the question, that "In the harder fought battles of the Peninsula, as at Waterloo, the mortality among officers was more than 50 per cent. greater than privates, regarding only those that were actually engaged;" but this calculation is founded on the hypothesis that the deaths among the wounded are in the same proportion in all ranks, which, from the reasons already given, must be considered erroneous.

According to the best estimate I have been able to frame, the mortality from casualties, occurring during the three days' fighting at Waterloo, was about 84 per 1,000 for officers, and 63 per 1,000 for non-commissioned officers and rank and file.

The great advantages enjoyed by the officers in exemption from disease may be seen by reference to Table VIII. in the Appendix, showing the sickness and mortality for ten weeks in the army at Walcheren, when the deaths among the privates were in the propor-

* Naval Gunnery, 4th edition, p. 513.
† Ibid., p. 511.

tion to an annual mortality of 640 per 1,000, and among the officers to that of 181 per 1,000, the average number of sick being 470 privates and 166 officers per 1,000 of the respective classes.

Although I cannot offer the Tables in the Appendix (I. and II.) as complete statistical pictures, which it was my wish to make them, of the British army during the period they embrace, I trust they may be considered to have some value as a contribution to the history of a momentous period in the annals of England, containing as they do information of a kind that has been rarely given at all, and still more rarely with accuracy. The statistics of national defence must surely be an important element both in the economical and political history of a country, yet it is astonishing how little they are attended to in England. In a collection of the statistics of the Empire, for the fifteen years ending with 1854, presented to the Houses of Parliament by command of Her Majesty, there is no mention whatever of the extent of our military and naval forces, not even the numbers of men annually voted being stated.

Table II. is believed to be the first attempt to give a general view of the effective strength of the British regular army during the period under consideration. Statements upon the subject may occasionally be found in historical works, but they are in the majority of cases incorrect. A very remarkable instance of this occurs with respect to the projected invasion of England, in the years 1804 and 1805, by the Emperor Napoleon I. There are few questions more interesting to the statesman, or to the historical student, than to consider the result that would have ensued if an attempt at landing had succeeded. The first object of the enquirer would naturally be to ascertain what force this country could have brought forward to repel the attack; but if he turn to the works of the two writers, who may be called the national historians of the struggle, Thiers and Alison, he will find assertions upon the subject differing widely from each other and from the truth.

The following is a comparative statement of the strength of the British military force, in 1804, according to

	Thiers, Book XVIII.	Alison, Chap. 38.	Adjutant-General's Returns, increased for Officers and Non-Commissioned Officers, Cavalry, Infantry, and Artillery.
At Home—			
Regular Army....	80,000	129,572	114,360
Militia	70,000	109,947	98,900
	150,000	239,519	213,260
Abroad.....	50,000	61,527	54,243
	200,000	301,046	267,503

The English historian's numbers are derived from the estimates voted for the year, and his error would have been much greater if he had not omitted the estimates for the artillery, for foreign and

colonial corps, and for men to be raised under the Additional Force Act, which would have increased his total to 338,000 men. There is obviously, however, a great difference between voting the levy of a number of men and having that number raised and equipped. The effective force was always below that voted, and frequently fell very far short of it, as appears from the following return of the numbers of men wanting to complete the regular army at the periods named:—

On the 1st of January,	1805	54,288
,, ,,	1806	38,069
,, ,,	1807	35,656

The statements given by Sir Archibald Alison of the military strength of this country, being for the most part taken from the annual number of men voted, are generally erroneous.

The statement at page 235 illustrates the relative dangers of the military and naval services. It appears therefrom that during the last great war the man who entered the army ran between two and three times if a private, and between three and four times if an officer, the risk of injury in battle that was encountered by one who entered the navy, and that the general chance of death in action to the one was double that of the other. When the soldier was ordered on service abroad, the latter risk became three times as great to the private, and nearly four times as great to the officer, while to those engaged in actual hostilities it was respectively seventeen and twenty-two times that of the sailor, the whole navy being considered on active service in time of war. These ratios, however, would be greatly lessened if we were to include in our estimate the danger from shipwreck, which made the seaman's risk of death from the casualties of the service three times that of death in battle.

During peace the average mortality of the army serving at home and abroad is about double that of the navy, but it is one-third more only during war, in which, however, it is double for the portion of the army serving abroad, and four times as great for troops engaged in actual hostilities.

Napoleon* has said that a fleet of thirty sail of the line at sea may be considered equivalent to an army on land of 120,000 men. Lord Nelson commanded twenty-seven sail of the line at the battle of Trafalgar, and the English, on that day, lost in killed and wounded 1,690 men.

At Borodino, out of a force of 133,000 French, 28,085, or 211 per 1,000, were killed or wounded. In the campaign of Waterloo the allied force was 230,000 men, and their total casualties 36,590, or 159 per 1,000. The average strength of the English navy, from 1793 to 1815, was 110,000, and its total loss in killed and wounded, during the period, was 19,382, or 176 per 1,000. Such is the disproportion in carnage, that a single battle on land has been more destructive to life than twenty years of combats at sea.†

These facts are not adduced to depreciate the valour of the

* Mémoires, vol. v., p. 24.

† Le soldat de mer sur son escadre ne se bat qu'une fois dans une campagne; le soldat de terre se bat tous les jours.—*Napoleon, Mémoires*, vol. v., p. 25.

English navy, whose prowess and skill have been the shield of their country during so many centuries, but to point out, as not among the least of the blessings vouchsafed by Providence to this nation, that, while our peculiar means of defence have proved so much more effectual than those of other countries, they are maintained at so much smaller an expenditure of the lives of our fellow-citizens.

Sickness.

That disease is generally more fatal to an army in the field than the sword of the enemy is almost a proverbial truth, and one that has been lately impressed upon the minds of the English people by facts of a deeply painful character.

The enormous amount of sickness that in modern times has nearly always been the consequence of active military service, is supposed by some not to have attended the operations of ancient armies, particularly the Roman; and this immunity is thought to have arisen from the greater powers of endurance of the soldiers as well as from the more prudent management of their commanders.

The British army scattered over the globe in the various dependencies of the empire, many of them situated in unhealthy climates, suffers during peace from a considerable extent of sickness which, even in the army at home, greatly exceeds the average amount among similar classes of persons in civil life.*

That men, selected on account of their bodily vigour, well fed, clothed, and housed, and enduring no hardships or privations likely to be injurious to health, should suffer from sickness to a greater extent than those apparently less favourably circumstanced is a fact that must excite surprise, and is well worthy the attention of the military authorities.

In the Journals of this Society are to be found a large collection of statistical results drawn from the records of extensive enquiries ordered by the government as to the sickness of the British troops during peace, but very little official information upon the same subject during war, particularly when carried on upon a large scale, has been given to the world. We are indebted to Sir William Napier for the publication, in his history of the Peninsular war, of several returns showing the proportion of sick among both the French and English armies engaged in that contest, and to Mr. Edmonds for half-yearly returns, during the latter part of it, relating to the English army, and from these statements I have compiled Tables VI. and VII. in the Appendix.

* *Statistical Journal*, vol. ii., p. 258.

The following is a

Comparative Statement of the Proportion of Sickness in Various Armies.

	Total Average Strength included in the Returns.	Number of Returns included in the Average.	Proportion Sick to 1,000 Total Strength.		
			Lowest.	Highest.	Average.
French—Egypt (1801)	23,400	2	....	....	125
Army of Spain (1808 to 1813)	299,000	15	103	194	130
Army of Portugal (1808 to 1813)	94,700	8	64	235	146
English—Peninsular Army (1808 to 1814)	44,500	19	94	330	209
Egypt (1801)	17,000	2	103	261	182
Walcheren (1809)	21,100	11	72	587	326

The facts in this statement as to the sickness in the French and English armies in the Peninsula were taken from the returns just mentioned. Those as to the armies of both nations in Egypt from Sir Robert Wilson's history of the English expedition to that country; and those as to the sickness at Walcheren, from the Parliamentary papers that have been referred to before.

The Duke of Wellington* has laid it down as a rule, that "in all times the sick list of an army on active service amounts to at least 10 men in 100, or 3,000 upon 30,000," but it will be seen upon reference to Table VI. in the Appendix, that among the troops in the Peninsula the number of sick was always in a much greater ratio, except at the end of the year 1808 and beginning of the year 1809, when the army was not engaged in active operations, the troops under Sir John Moore not being included in the Table. The lowest amount of sickness in the Peninsular army was in April, 1809, and the highest in October, 1811, when out of 57,781 men, 19,880, or 330 per 1,000 of the whole strength were in the hospitals. The average of all the returns is 209 per 1,000 constantly sick. Mr. Edmonds, in the half-yearly returns, from 1811 to the beginning of 1814, which I have mentioned, found the average to be 225 per 1,000, but neither of these statements can be considered as founded on such complete data as to establish the average proportion with accuracy, monthly returns at least being required for that purpose. The highest ratio of sickness among the French (Appendix, Table VII.), in the Peninsula, was 194 per 1,000, the lowest 103 per 1,000, and the average 130 per 1,000.

In a note on Mr. Edmonds' paper in the "Lancet," he mentions that in July, 1809, immediately before the battle of Talavera, the French army consisted of 275,000 men, "of whom 61,000, or $22\frac{1}{4}$ per cent. were sick." This is no doubt correct, but I have not met with any return giving so high a ratio.

The general average of the sickness in the French armies, both

* Despatches, vol. v., p. 275.

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in Spain and Egypt, appears, so far as the returns can be trusted, to have been lower than that of the English; and the Duke of Wellington, in a despatch dated the 9th of June, 1812, expresses surprise that in Marshal Soult's army there should be only 4,869 sick out of a gross number of 68,200.*

In a comparison of the relative sickness of the French and English armies in Spain, there are, however, several points to be considered. The English was essentially an army of operation, constantly engaged in active service, the brunt of every campaign falling principally upon it. The greater part of the French troops consisted of armies of occupation regularly quartered in the country, and having only to contend with Guerrillas and the feeble Spanish armies, which they so frequently and easily dispersed. A more just comparison would be made with the army of Portugal, which, though smaller in amount, was more constantly engaged in active operations. The lowest ratio of sickness in this army was 64 per 1,000, and the highest 235 per 1,000, the average being 146 per 1,000, which still is lower than the English ratio.

Another circumstance to be borne in mind is, that as the English army was almost invariably successful, very few of its wounded were taken prisoners, while a large number of the wounded French having been taken, their sick lists would thereby be proportionably diminished.

An important admission made by the Emperor Napoleon himself, in his Memoirs, must also be mentioned. He relates† that, in Egypt, he agreed with the heads of corps they should overcharge, by one-third the real quantity of provisions, arms, and clothing distributed to the troops, and he speaks of the astonishment expressed by the author of an account of the French campaigns in Egypt, at finding that the orders of the day showed the army to amount to 40,000 men, although the writer had ascertained from authentic facts that the real number was much less. Napoleon continues that, in 1796 and 1797, and since (*et depuis*), the same means were employed in order to excite exaggerated notions of the numbers of the French forces. The returns of effective strength were called in the French army, "*Etats de situation*," and I do not know whether they were included in the orders of the day (*Ordres du jour*), but if so, and if they were dealt with in this manner without a proportionate increase in the numbers of the sick, the ratio of the latter would thereby be much diminished.

Notwithstanding the great public excitement, and the numerous investigations that have arisen out of the expedition to the Crimea, I have only found one return,‡ having a distinctly official character, to show the exact proportion of sickness in the army there. This was dated the 2nd of October, 1854, before the commencement of the siege of Sebastopol. In the third report of the Crimean Committee (Appendix, page 470), there is a "return showing the total number of men of Lord Raglan's army sick and wounded (of all

* Despatches, vol. ix., p. 223.
† Mémoires, vol. viii., p. 119.
‡ 3rd Report of Committee.—Appendix, 4 73.

arms) during each month from their landing in Turkey," giving these numbers :—

1854.		1854.	
April	503	October	11,988
May	1,835	November	16,846
June	3,498	December	19,479
July	6,937	1855.	
August	11,236	January	23,176
September	11,693	February (imperfect)	16,964

From a comparison with other returns I find that these are not the average numbers sick during each month, but the total of those applying for assistance at the hospitals, and they cannot, therefore, be used to ascertain the average number sick. Several returns were published during the latter part of the war, but they appear to include only the number of sick in the Crimea, without reference to those at Scutari and elsewhere. The return dated the 2nd of October, 1854, shows that out of 34,642 non-commissioned officers and rank and file, 6,777 were sick, being at the rate of 195 per 1,000. Among these the wounded are included, and of the whole number sick 328 only were present with the army; the remainder, with the exception of those wounded at the Alma, must therefore have been left at Varna. The wounded at the Alma were 1,539, and although many of these must have died before the 2nd of October, the news of their deaths would not probably have reached the head-quarters by that time, as they were all, immediately after the battle, sent on board the fleet for transport to Scutari. Deducting for the whole of the wounded at the Alma, and the sick present with the Army, together 1,867, from the total sick (6,777), there remain for the sick at Varna 4,910, which upon the total strength at the period of embarkation, about 35,000 men, is at the rate of 140 per 1,000, or nearly one-seventh of the whole force, a greater amount of sickness than the average of the French army of Spain, and nearly as great as the army of Portugal (page 247) while engaged in very active campaigns, this too, although not a soldier in Lord Raglan's army had fired a shot, or seen the uniform of an enemy.

A complete return of deaths, up to the 15th February, 1855, was laid before the Crimean Committee, and is to be found in the Appendix to their Second Report (page 688). According to this, there died—

Of sickness from the first landing in Turkey to the embarkation for the Crimea on the 6th September, 1854		903
In the Crimea from casualties in action	1,481	
,, disease	4,300	
		5,781
In other hospitals from disease and wounds		2,167
On their passage from the Crimea, from the same causes		882
Total deaths		9,733

From the number of casualties that actually occurred up to the 15th February, the deaths they caused should probably be increased from 1,481 to 1,910; and the statement would then stand thus :—

	Deaths.		
	From Casualties.	From Disease.	Total.
From the landing in Turkey to the 6th of September, 1854	....	903	903
From the 6th of September, 1854, to the 15th of February, 1855	1,910	6,920	8,830
Total	1,910	7,823	9,733

Various statements were laid before the Committee of the numbers and dates of the reinforcements sent to the East; and I have calculated from these, that the average strength of the army, during the first of the above periods, was 25,000, and during the second 42,500, of all ranks.

Each of the periods was of five months' duration very nearly. The mortality in the first arose from disease alone, and was at the annual rate of 87 per 1,000, or three-fourths of that from the same cause among the troops engaged in active service in the Peninsula.

In the second period it was equivalent to an annual mortality per 1,000 of

108 from casualties in action, and
391 from disease, or

499 from all causes.

being about double the annual ratio of deaths from casualties in the Peninsula, and $3\frac{1}{2}$ times those from disease.

The Crimean Commissioners state in their Report (page 3), that the mortality for the seven months ending with the 30th April, 1855, appeared to amount to about 35 per cent. upon the average strength, which is equal to an annual ratio of 60 per cent., or 600 per 1,000.

I have compiled from the columns of the "Times" a classification of 4,259 deaths in the hospital at Scutari. This statement, not being derived from official returns, may perhaps be liable to error in some respects; but it is not without value for the purpose of general comparison with a similar statement of the causes of 16,970 deaths in the Peninsular army recorded by Sir James McGrigor, viz.:—

Causes of Death.	In the Peninsular Army.		In the Hospital at Scutari.	
	Number of Deaths.	Proportion of 100,000 Deaths.	Number of Deaths.	Proportion of 100,000 Deaths.
Diarrhœa and dysentery	4,940	29,110	2,451	57,549
Fever	6,761	39,842	739	17,351
Catarrh, pneumonia, bronchitis	606	3,571	169	3,968
Gelatio	....	....	327	7,678
Wounds	3,411	20,100	238	5,588
Other causes	785	4,626	215	5,048
Not specified	467	2,751	120	2,818
Total	16,970	100,000	4,259	100,000

The proportion of deaths from diarrhœa and dysentery at Scutari was double that in the Peninsula; but from fever very much smaller. This is remarkable, considering the assertion of a celebrated traveller that the slightest imprudence or exposure leads to a fever in the Crimea.*

During Sir James McGrigor's superintendence of the medical department in the Peninsula, which lasted two years and a half, 352,272 cases were admitted into the hospitals; so that a number nearly equal to the whole force went through the hospitals twice in each year. The proportion of recorded deaths to the numbers treated was one in 20·8, or 4·8 per cent.; but 81,582 cases are entered as "transferred," and the results of these were, of course, unknown. Of the remainder, the deaths were 1 in 15·9, or 6·3 per cent. Out of 17,537 admissions to the hospital at Scutari, there were 3,062 deaths, being 1 in 5·73, or 17½ per cent., and 5,824 of the cases were still under treatment when the return was made up. It is probable that all the cases sent to this hospital were severe ones, while the Peninsular returns contain a large proportion that were only slight.

No person can have his attention drawn to such an enormous amount of sickness and mortality without feeling an earnest desire to ascertain its causes and the means of preventing it, if possible, in future.

The following observations of Mr. Edmonds, published in 1838 in his paper on the mortality of the Peninsula, derive peculiar force from the events of the last two years:—"That an English army," he said, "of 61,511 men, during a period of three years and five months, should have had 13,815 men, or 22½ per cent., constantly sick, and that no inquiry should have been instituted as to the causes of the sickness, is a serious national reproach."

In the course of the present inquiry, I have collected numerous facts, and many suggestions have occurred to my mind with respect to this part of the subject; but, although they appear to me to be of great interest and importance, I refrain from laying them before the Society, partly on account of the great length of this communication, and partly because they are not of a strictly statistical character.

Battles.

The table in the Appendix No. III. contains the particulars of all the great battles in which British troops have been engaged since the commencement of the present century, excepting those that occurred in India, with respect to which I have not been able to obtain information sufficiently precise to include them in the statement.

This country has generally been entitled to the undivided glory of its naval achievements, the fleets of allied nations having rarely participated in them; but our operations upon land, in Europe at least, have almost always been carried on in conjunction with the forces of other powers.

Of the nineteen great battles included in the table four only were fought by British armies unassisted by troops of any other nation.

* Clarke's Travels.

From this circumstance, I have been compelled, in order to give a complete view of the results of the several actions, to state, in separate divisions of the table, the loss sustained by the British only, and the total losses of the whole of each army, including British and Allies. The effective strength of the troops engaged is also given in each case, and the proportion of casualties per 1,000 deduced therefrom. In the table relating to naval engagements,* I was enabled to give, with considerable accuracy, the strength of the enemy's force, and the loss that it sustained in each action, thereby furnishing materials for some useful comparisons; but it is impossible to follow the same course with respect to land battles, from the great uncertainty in most cases both as to the strength and casualties of the enemy. The losses sustained in actions by foreign armies are not always officially published; and, when published, the numbers given cannot always be relied upon. No dependence whatever is to be placed upon the general estimates inserted in historical works, which vary enormously, according to the prejudices or the wishes of the persons making them. The only sure guides to such information are to be found in official returns. It is, indeed, true that these may be incorrect or may be garbled when published; but no person that has not access to accurate original returns can pretend to fix with precision the losses of an army. The English returns, as mentioned already,* give the numbers of rank and file, or, to use a common term, of bayonets and sabres only, without including the officers and non-commissioned officers; and proportionate additions for both these classes have, therefore, been made in the table. The non-commissioned officers are taken at the rate mentioned at page 223, or 72 for every 1,000 rank and file, but the officers at only 40 to 1,000 non-commissioned officers and rank and file, instead of 48, as estimated for the whole army at page 225, a reduction made in order to allow for the large numbers of officers engaged at home in what may be called the civil departments of the army. The proportion of officers adopted appears to agree with that in both the English and French Crimean armies. According to a statement from the War Department, made in Parliament, "the Admiralty had transported, from the 7th of February, 1854, to the 22nd January, 1855, 2,141 officers, and 54,224 men of the English army, and 556 officers, and 14,055 men of the French," being, in both cases, at the rate of 39·5 officers to 1,000 men. The precise strength of the artillery and engineers is very rarely given in the British returns, the number of guns only being stated.

As the casualties happening to these corps, however, are included in the general list, it is necessary to make an estimate of their numbers.

They have been taken at an average of 40 men per gun, which appears to be about the general proportion, allowing for those sick and absent. At the Battle of Talavera the English had 30 guns and 1,287 men of the artillery and engineers present.† At Waterloo the English artillery consisted of 191 guns and 8,166 men, exclusive of 1,240 of the engineers and field-train.‡ Napoleon, at the same

* Page 223.

† Alison, vol. ix., p. 422. ‡ Siborne, vol. i., p. 426.

time, had 350 guns with 10,901 artillerymen, the engineers and field-train amounting to 5,600 men.* There seems good reason to conclude that the force of the Prussian army in artillery, in the above campaign, is under-estimated in Capt. Siborne's work, as he assigns only 5,303 artillerymen to 312 guns, which is not more than 17 men per gun.

The majority of the battles recorded in the table were fought in the Peninsular War; and the strength of the armies engaged in these has been taken in each case from Sir William Napier's History. In some instances his statements have been compared with those of other writers, almost all of whom, however, have relied upon his authority. The effective strength at the battle of the Alma is accurately given from a parliamentary return,† but I have had great difficulty in ascertaining the numbers at the battle of Inkermann. According to Lord Raglan's dispatch not more than 8,000 British troops were engaged in that action; but the returns of killed and wounded include casualties in three regiments of cavalry and twenty-six battalions of infantry, besides artillery, so that, if the dispatch be correct, the infantry could not have averaged more than 270 men per battalion, a number almost incredibly small. Having no other guide, I have adopted Lord Raglan's estimate, concluding, however, that it referred to rank and file only, and making proportionate additions for officers and non-commissioned officers.

From the general result of Table III. it appears that in the nineteen battles recorded, an aggregate British force of 438,205 officers and men were engaged; that of these 49,921 were either killed or wounded, of whom 14,517, being very nearly 30 per cent., died from the injuries they received, and that the casualties averaged 114, and the mortality 33, for every 1,000 men engaged.

Mr. Edmonds has estimated the average mortality of the British troops in four battles—Talavera, Salamanca, Vittoria, and Waterloo—at 3·9 per cent. for the officers, and 2·1 per cent. for the private soldiers,‡ but from two causes of error he has under-estimated the mortality, particularly in the first three battles. I have already pointed out that the proportion assigned by him for deaths among the wounded is too low, but a much greater difference in the present case arises from his having assumed, apparently, that the whole strength of the army in the Peninsula, as shewn by the muster-rolls, was present in each action. Thus he gives the numbers of British at the battle of Talavera as 39,586, but from a return printed by Sir William Napier, it appears that, including cavalry, infantry, and artillery, there were only 19,846 rank and file present.§ The loss of the British in this action was very severe, being at the rate of 213 casualties, and 63 deaths, per 1,000 engaged, whereas Mr. Edmonds, founding his calculations upon a much larger number than was actually present, makes the mortality 4·4 per cent. for the officers, and 2·6 per cent only for the private soldiers. His estimates for Salamanca and Vittoria are below the actual mortality from the same cause.

* Siborne, vol. i., p. 433.

† Committee's 3rd Report, Appendix No. 10.

‡ Lancet, 1837-8, vol. ii., p. 148. § Appendix, vol. ii., p. 449.

The lowest ratio of casualties shown in Table III. is 22 per 1,000. This was at Busaco. The highest for the whole force engaged in any single battle was at New Orleans, where the British were defeated with a loss, in killed and wounded, of 317 per 1,000. The British suffered in a greater ratio than this at Albuera, where they had 395 per 1,000 killed or wounded. The casualties of the total force engaged in that battle, including both British and Allies, were however, only 176 per 1,000. In nearly all the actions fought in conjunction with allies the greater ratio of loss was borne by the British; their casualties averaging 114 per 1,000, while those of the aggregate force of British and Allies averaged 98 per 1,000 only.

From the returns as to the battle of the Alma we are able to assign the proportion of losses which there fell upon the different branches of the service.

*Battle of the Alma, 20th September, 1854.**

	Force Engaged.	Numbers Killed and Wounded.	Ratio per 1,000 Engaged.
Cavalry	1,100	1	1
Infantry	22,600	1,937	86
Artillery and Engineers	3,100	34	11
Total	26,800	1,972	74

In Table III. a column is inserted to show whether the action was offensive, or defensive, on the part of the British.

This is done with a view to the elucidation of an important point in military science. "Military men," says Napoleon, "are much divided upon the question whether it is more advantageous to give or to receive the attack." It appears probable that a classification of the results achieved, and the losses sustained, in a large number of battles might assist materially in the solution of this problem, and the distinction has accordingly been made in the table. It is not supposed that the number of actions there recorded is sufficient to lead to a decisive conclusion; but it is one of the objects of the present paper to point out in addition to the results actually established, those that might be attained, by military statistics.

Among the latter of these, the determination of the relative efficiency of the different weapons of warfare, is one to which sufficient attention appears hardly to have been paid. The great object of all military organization must be the fullest developement of the destructive powers of troops. To this end their equipment and training, as well as their formation and discipline, everything, in fact, connected with tactics and strategy must be directed; and it becomes, therefore, of importance to ascertain the relative effects of the different arms employed.

Some information upon this subject may be obtained from a return, furnished by the surgeon of the Scots Fusilier Guards,

* Committee's 3rd Report, Appendix, No. 10.

of the nature of the wounds received by the men of that regiment at the battle of Inkermann, the 5th of November, 1854.

Wounded by	Severely.		Slightly.		Total Number.	Proportion per 1,000.
	Total Number.	Proportion per 1,000.	Number.	Proportion per 1,000.		
Bayonet.....	3	46	4	190	7	59
Gunshot.....	62	954	17	810	79	658
Contusions	....	....	....	....	34	283
Total	65	1,000	21	1,000	120	1,000

It has been confidently and repeatedly asserted that the victory at Inkermann was won by the bayonet, which it is said was there more extensively employed than on any other occasion since the battle of Maida. In the Russian official account of the action it is called an embittered bayonet contest, and they boast that their troops had not only challenged, but frequently put to rout the well fed and powerful British soldiers with what the latter considered their own peculiar weapon.

The brigade of Guards was more constantly and closely engaged in this battle than any other portion of the army. This is proved by the fact, that out of 2,382 casualties suffered by twenty-six battalions, 594, or one-fourth of the whole, were borne by the three battalions of guards; and yet we find that in one of these, notwithstanding the assertions referred to, the proportion of bayonet wounds received among those returned as wounded was less than 6 per cent. of the whole.

The popular notion in England is that the efficiency of the British infantry depends principally upon the determination with which they use the bayonet. It does not of course come within the objects of this paper to discuss questions of military tactics, except to show how far they may be illustrated by military statistics; but if it were otherwise, there would be no difficulty in proving that the opinion in question is entirely a delusion, and that, as an able writer has already pointed out,* the almost uniform success of the British infantry during the last war, arose in a great measure from the fact that the formation in line they invariably adopted in action produced a much greater developement of musketry fire than the formation in column adopted by their opponents; and, moreover, that so far from their victories having been due to the bayonet, a reliance upon that arm as the principal weapon of offence was the entire cause of two out of the very few severe defeats they suffered during the war, one of the two being the most disgraceful check ever experienced by the British arms.

The conclusions here pointed out are in accordance with all the facts of history, which show that nations possessing the most efficient missile weapons, have always been the most successful in war.

* Revelations of Russia, vol. ii., p. 50.

From the statistics of the battle of Balaklava, another proof may be obtained of the relative destructive powers of cannon and musketry compared with those weapons which the French include in the comprehensive expression,—"*les armes blanches.*"

The British cavalry in that action consisted of a light and a heavy brigade, each of which made a charge in the course of the day. The heavy brigade were opposed by a body of Russian cavalry only, which, although it was very superior in numbers, they attacked and defeated. The casualties they suffered were of course principally produced by the weapons of cavalry, lances and sabres. The charge of the light brigade is too well known to need description—they were nearly destroyed, suffering from every description of weapon used in modern war, particularly from artillery.

The following is a statement of the relative proportion of deaths among the casualties of each:—

	Total Casualties.		Proportion to a Total of 1,000.	
	Heavy Brigade.	Light Brigade.	Heavy Brigade.	Light Brigade.
Killed.....	9	160	85	569
Wounded	97	121	915	431
Total	106	281	1,000	1,000

It is not surprising that the casualties in the light brigade should have been in so much larger a proportion, but it is a remarkable fact that more than one-half of those injured were killed outright, while in the heavy brigade only 1 in 12 of those injured were killed.* The ordinary proportion in land battles is 1 killed to every 5 casualties.

Sieges.

The Table numbered IV. in the Appendix, contains details as to various sieges in which the troops of this country have engaged in the course of the last hundred years, that of Sebastopol being included. I have collected, as far as they were attainable, the particulars of all the English sieges that occurred in that period, excepting such as took place in India, but I have only inserted in the Table those with respect to which the information obtained is sufficiently precise to lead to definite conclusions.

The date, duration, and result of each siege, is given, with the force of the besiegers, and the number killed and wounded among them, together with the ratio of the casualties to 1,000 men engaged. The strength and casualties of the garrisons are also stated where they could be ascertained.

* In this action private John Dryden, of the 11th Hussars, forming part of the light brigade, received 24 lance and 7 sabre wounds, and being left on the ground for dead was taken prisoner. He, nevertheless, recovered, and having been exchanged, was doing duty with his regiment in January, 1856. This was certified in a letter from the surgeon of the 4th Dragoon Guards, published in the newspapers.

A column in the table shows as to each siege whether it was undertaken by the British alone or in conjunction with allies; but, in the latter case, the aggregate numbers only of the besieging force, and of the casualties suffered, are given without reference to the national distinctions made in Table III.

The severe criticisms of some French writers upon the methods of attacking fortified places adopted by our engineers, make it an object of interest to compare the results of the systems of the two nations; and information with respect to seven French sieges, similar to that given as to the English, has accordingly been inserted in a continuation of the table. The facts as to the English sieges in the Peninsula, were taken from Sir John Jones' Journals, and those as to the French from the *Journaux, etc.*, of Captain Belmas.

The difference between the modes of attack above alluded to, consisted in this:—the French, proceeding according to the strict rules of art, pushed their approaches so close to the body of the place that, when a breach was effected, the success of the assault was secured, and the garrison were therefore compelled to capitulate; while the English, less scientific or less patient, breached the walls and sent forward their troops to the attack from such a distance as to expose them to the certainty of a heavy loss as well as to the risk of failure, the disadvantages to the assailants being generally such as to encourage the garrison to make a vigorous resistance. This course, although less sure than the other, and involving a much greater sacrifice of life, effected when successful a saving of time.

Accordingly we find that the average duration of the English sieges recorded, exclusive of that of Sebastopol, was only $13\frac{1}{5}$ days, that of the French being $33\frac{5}{7}$ days; but that while the casualties of the former averaged 113 per 1,000, those of the latter were only 73 per 1,000 of the force engaged.

For the purpose of a more complete comparison, I have classified the fortresses captured by both nations under the heads of those that capitulated and those taken by assault, showing the

Average Results of Fourteen successful Sieges.

Places taken by		Number of Sieges.	Duration in Days.		Aggregate Force Employed.	Casualties.	
			Total.	Average.		Total.	Per 1,000.
Capitulation	French armies	4	143	$35\frac{3}{4}$	154,800	6,633	43
	English armies	4	93	$23\frac{1}{4}$	47,900	2,403	50
		8	236	$29\frac{1}{2}$	202,700	9,036	44
Assault	French armies	1	28	28	21,500	4,209	196
	English armies	5	59	$11\frac{4}{5}$	63,700	11,228	176
		6	87	$14\frac{1}{2}$	85,200	15,437	181

Here we see that although the places assaulted were taken on an average in half the time required to gain possession of those that

capitulated, the ratio of loss suffered by the besiegers before the former was quadruple that before the latter.

An unusual opportunity for comparing operations of this description occurs in reference to the Peninsular War. The two fortresses of Badajoz and Ciudad Rodrigo were each of them successively besieged and captured by the French and English armies. The former with an average force of 22,500 men obtained possession of both places by capitulation, at the cost of 2,830 killed or wounded, the time occupied in the two sieges being 65 days. The English took both places by assault. Their average force was 21,200, and their loss 5,820 killed or wounded in the two sieges, which lasted 32 days in all. It is a curious fact that the respective losses are very nearly in the inverse ratios of the respective times $\frac{1}{3\,2} : \frac{1}{6\,5} :: 5{,}820 : 2{,}865$, the last number being only 35 in excess of the French casualties.

The English Engineers have been accused of needlessly sacrificing the lives of the soldiers by their methods of attack, and it is therefore but justice to them to point out that they did not hesitate to expose their own. This is shown by the following

Comparative Statement of the Casualties among Officers of the Engineers and Artillery at various Sieges.

	Engineers.				Artillery.			
	Employed.	Killed.	Wounded.	Total Casualties.	Employed.	Killed.	Wounded.	Total Casualties.
Badajoz (1st siege)	21	5	3	8	§	1	3	4
Ciudad Rodrigo	19	2	5	7	14	....	2	2
Badajoz (2nd siege).....	24	4	7	11	38	6	8	14
Forts of Salamanca.....	3	....	....	....	14	1	1	2
St. Sebastian (1st siege)	22	1	4	5	39	1	1	2
,, (2nd siege)	17	3	3	6	54	....	1	1
Total	106	15	22	37	159	8	13	21
Ratio of casualties to a strength of 1,000	349				132			

At the second siege of Badajoz nearly one-half the Engineer officers employed were either killed or wounded.

The siege of the citadel of Antwerp in 1832, described in the French division of Table IV., may be taken as a measure of the smallest amount of loss with which a place strongly fortified and sufficiently garrisoned and defended can be captured. The force of the besiegers was very large, the means at their disposal ample, and they were under no necessity to hurry their operations as there was not the slightest prospect of the place being relieved. The garrison, therefore, had no inducement for extraordinary exertion, more particularly as the only motive for the defence was a foolish point of honour. The siege lasted 24 days, and the loss of the French in killed and wounded, out of a force of 66,500 of all arms, was only 803, or 12 per 1,000.

The actual deaths probably did not exceed 210, or 3·16 per 1,000. The loss of the garrison in killed and wounded was 110 per 1,000.

There is, however, one point which it is necessary to bear in mind as to the relation between the duration of sieges and the losses they cause. The labours of the trenches are very harassing to the soldiers, and produce an increase of sickness and consequent mortality among them; these are of course diminished by shortening the operations, and, in order to arrive at correct conclusions, we must know the number of deaths from disease occurring during a siege, as well as those from casualties in action. If it be true, as some persons have supposed, that Sebastopol might have been captured by a vigorous assault at the time the Allies first appeared before it, when its formidable defences had not been begun, there is hardly any conceivable amount of loss consistent with the success of the attempt that would not have been productive of a saving of life.

The siege of this place has been included in the table on account of the great interest it naturally excites at present, although there are some points connected with it upon which further information is required. Even that we possess as to the British portion of the besieging force, which is alone included in the table, is imperfect, there being no returns to show its average strength during the siege. At page 250 I have stated the grounds upon which I estimated this at 42,000 men for the first five months. For the whole period I have taken it at 50,000 men, which is not perhaps far from the truth. On the 9th of October, 1855, it was 54,600, and on the 16th 53,500 men,* but these numbers include rank and file only, and must be considerably increased for officers and non-commissioned officers. The army at the last of the above dates had probably been reduced by the transfer to Scutari of a large number of wounded men.

Table No. IX. in the Appendix contains a complete classification of all the returns of killed and wounded from the landing of the army in the Crimea to the 8th September last, when the town of Sebastopol was evacuated by the Russians. I cannot be certain that there are no errors in this table, because I have unfortunately not been able to verify it in the manner I intended, but it has been carefully drawn up, and it agrees very nearly in its general results with a statement published some months ago in the newspapers. In this the total numbers of killed and wounded for the period named were given at 13,849, while by Table IX. they appear to have been 13,880. The method of classification adopted will be best understood by the following summary, in which the estimated mortality is founded on the numbers killed, increased for deaths among the wounded and missing, calculated upon the principles laid down in page 228.

* Although the military authorities appear to have carefully, and very properly, avoided publishing direct information as to the strength of the army, the Reports of the head of the Medical Department, inserted in the "Gazette," occasionally stated not only the numbers of deaths and admissions to the hospitals, but the exact ratios those numbers bore to the total strength, which could, of course, be ascertained from such data by a simple arithmetical process.—See "Dr. Hall's Report," dated 16th October, 1855.

Summary of the Returns of Killed and Wounded in the British Army in the Crimea from the 19th September, 1854, to 8th September, 1855.

		Staff.	Artillery, Engineer, and Train.	Cavalry.	Infantry.	All Arms.	Officers.	Non-Commissioned Officers and Rank and File.
Siege duties		1	504	....	4,060	4,565	154	4,411
Assaults		10	153	....	4,233	4,396	290	4,106
Total siege		11	657	....	8,293	8,961	444	8,517
Battles		30	171	398	4,320	4,919	297	4,622
Total		41	828	398	12,613	13,880	741	13,139
Estimated deaths							223	3,973
Proportion in 100,000	Siege duties	22	11,040	....	88,938	100·000	3,374	96,626
	Assaults	227	3,480	....	96,293	100·000	6,597	93,403
	Total siege	123	7,332	....	92,545	100·000	4,955	95,045
	Battles	610	3,476	8,092	87,822	100·000	6,038	93,962
	Total	295	5,966	2,868	90,871	100·000	5,339	94,661
Proportions of estimated deaths							5·315	94·885
Estimated proportions of numbers serving							3,798	96,202

A portion of the deaths among wounded officers was ascertained from an actual return,* and the remainder estimated at $\frac{1}{12}$ of the wounded, a proportion agreeing within a small fraction with the facts shown in the return. The deaths among the wounded non-commissioned officers and rank and file are taken at $\frac{1}{8}$ of the whole, but it is greatly to be feared, from the various reports as to the state of the hospitals, that the mortality exceeded that proportion, particularly in the earlier part of the siege.

As we have no information respecting the average strength of the different classes included in the summary, the interest of the facts it contains is greatly diminished. The estimated proportions of officers and men serving are calculated according to the numbers of each class stated to have been despatched to the seat of war up to the 22nd of January, 1855 (see page 252), amounting in the whole to 56,365. In the absence of accurate returns of the average numbers serving, a comparison of these proportions with the relative casualties gives the nearest approximation we are able to make to the ratios of the latter borne by each class. So far as we are able to judge the peculiarity pointed out at page 242 as to the greater proportion of casualties sustained by the officers, has been fully experienced in the Crimea. If the estimate as to the relative strengths in officers and men be correct, the officers formed 3·798 per cent. of the whole force,

* Parliamentary Papers, 204, 1855.

but the average proportion of casualties to that class was 5·339 per cent. In the ordinary siege duties the casualties to officers were 3·374 per cent. only, being in a less proportion than their numbers; in the battles the ratio rose to 6·038 per cent., and in the assaults to 6·597 per cent. The proportion of total deaths to 1,000 casualties among officers in the Crimea was 301, a much greater number than during the period (1793—1815) included in Table II., when it was only 234. The ratios of deaths among wounded officers appear to have been exactly the same in both periods, but the proportions returned as killed vary considerably, being 164 officers killed to 836 wounded from 1793 to 1815, and 233 killed to 767 wounded in the Crimea. The proportion of killed among the men was nearly the same in both wars, being 193 to 1,000 casualties in the first, and 190 to 1,000 in the second.

The protracted resistance which the Russians were enabled from peculiar circumstances to make at Sebastopol, is supposed by many to have been the result of discoveries in military engineering, and is adduced in support of an opinion that a new system of fortification founded upon the exclusive use of earthworks has been invented, which will have the effect, in siege operations, of neutralizing the superiority of the attack hitherto so universally admitted. These views, however, are erroneous. The value and the disadvantages of earthworks in fortification were as fully appreciated before, as they have been since, the siege of Sebastopol, which has not elicited any new principles, although it has amply confirmed the soundness of the leading rules previously laid down by the best authorities in military science.

The facts relating to this siege would seem to show that the enormously increased powers with which instruments of destruction have been endowed by the improvements of modern science, tend much more to the advantage of the besiegers than of the besieged, as might indeed have been expected. We have no means of ascertaining the losses of the Russians during the siege, but from their own statements they must have been immense. The official returns of their casualties in the two assaults of the 18th June and the 8th September have been published, and are given below. The additional losses from the 17th August to the 8th September are estimated from Prince Gortschakoff's report of the capture; the proportion of the missing, already mentioned at page 228, being added to the killed and wounded.

	Total Killed and Wounded.
August 17th	1,500
,, 18th to August 22nd	1,000
,, 23rd to September 25th	4,500
Sept. 6th to ,, 8th	3,968
Estimate for Artillerymen, not included in the foregoing	300
September 8th	10,808
	22,076
June 17th and 18th	5,776
Total	27,852

By reference to Table IX., it will be seen that the English casualties during the whole siege, exclusive of the battles fought, were 8,961, which a similar addition for the missing would increase to 9,100.

There are no means of forming an estimate of the French loss, but to take it at double our own would certainly be a liberal allowance. This would make, during the 338 days which the siege lasted, a total loss to the assailants of 27,300, a number less than the casualties of the garrison during 25 days only—those days, however, being the most sanguinary of any that occurred.

The French garrison of Badajoz, consisting of 4,870 men, inflicted, at the siege of 1812, 4,824 casualties in 20 days upon their assailants, with a loss to themselves of 1,600 only including deaths from sickness. In the same year, the garrison of Burgos, 2,000 in number, repulsed their opponents with a loss of 2,064 in killed and wounded during 32 days siege, their own casualties being 639. The garrison of St. Sebastian, in 1813, was 3,200 strong, and its losses, including deaths from sickness, amounted in 21 days to 1,700, whilst those of the besiegers in killed and wounded only were 4,420.

The following general summary of the results of Tables III. and IV., shows the

Average Mortality and Casualties caused by Battles and Sieges.

			Battles.		Sieges.			
			British only.	British and Allies.	Places taken by		Unsuccessful.	All Classes.
					Capitulation.	Assault.		
Number of each class			19	15	4	5	5	15
Ratio to a strength of 1,000	Deaths		33	not ascertained	18	59	59	42
	Casualties	Mean	114	98	50	176	169	131
		Highest	395	176	108	313	272	313
		Lowest	22	23	26	30	74	26

Having now touched upon all the leading points of this most important investigation, I have to beg the indulgence of the Society for the many material defects in the information which I have laid before them; some of these defects would no doubt have been avoided, had the subject fallen into abler hands; but that not a few of them were inevitable will, I think, be admitted on a consideration of the difficulties I have enumerated.

Before, however, concluding this imperfect communication, I cannot refrain from expressing, even at the risk of being considered presumptuous, the increased admiration which in the course of the enquiry has been excited in my mind for the gallant army that has recently prevailed against so many misfortunes in the East. However earnestly we may deprecate the evils of war,—however sternly we

may refuse to be dazzled by the brightness of military glory,—it is impossible to read without enthusiasm of the unflinching courage, the unrepining endurance, and the generous devotion of those brave and noble-minded men.

The character of the English soldier at two different periods of our history has been drawn by two living historians, each well qualified to appreciate and to describe his actions. Mr. Macaulay, after dwelling on the fervent piety, the strict morality, and the rigid discipline of the Puritan warriors of the Commonwealth, celebrates their stubborn English courage, and the disdainful confidence with which they marched against the most renowned battalions in Europe. Sir William Napier thus compares his brethren in arms with their opponents in the Peninsula:—"Napoleon's troops fought in bright fields, where every helmet caught some beams of glory; but the British soldier conquered under the cold shade of aristocracy: no honours awaited his daring, no despatch gave his name to the applauses of his countrymen; his life of danger was uncheered by hope, his death unnoticed. Did his heart sink therefore? Did he not endure with surprising fortitude the sorest of ills, sustain the most terrible assaults in battle unmoved, and, with incredible energy, overthrow every opponent; at all times proving that, while no physical military qualification was wanting, the fount of honour was also full and fresh within him."

Eloquent as these eulogiums undoubtedly are, they are not more than equal to the deeds by which they were inspired; but those deeds it should be remembered were performed by men whose fortune it was to be trained to victory by either one of two out of the three greatest military chieftains whose names our modern annals record.

Amid the failures that have dimmed the lustre of our national fame, it is still a source of pride and of consolation to feel that the praises awarded by history to the veterans of Cromwell and of Wellington may be applied, not only without exaggeration, but with the strictest justice to those young and inexperienced soldiers, who lately went forth in defence of the honour and safety of their country, to face for the first time the horrors of the field of battle.

If England shall continue to produce such men, it is not presumptuous to hope that, so far as human means can avail, her glory and her prosperity may be continued to distant generations.

APPENDIX.

Table I.

Abstract from the Returns of the Adjutant-General, showing the Increase and Diminution of the Cavalry and Infantry of the British Army, (including Foreign and Colonial Corps,) from 1793 *to* 1815.

N.B.—Numbers marked (*) are from defective Returns.

Years.	Mean Strength in Non-Commissioned Officers and Rank and File.			Diminution in Non-Commissioned Officers and Rank and File.				Recruits, including Men transferred from one Corps to another.
	Serving at Home.	Serving Abroad.	Total.	Deaths.	Discharges, including Transfers to different Corps.	Desertions.	All Causes.	
1793	No Returns		69,500	2,059	2,234	No Return	4,293	17,033
1794			106,100	8,596	4,229		12,825	38,563
1795			126,700	11,870	26,005		37,875	40,463
1796			116,300	9,858	14,634		24,492	16,336
1797			111,200	5,967	7,981		13,948	16,096
1798			116,800	4,008	7,772		11,780	21,457
1799			137,300	5,071	8,734		13,805	41,316
1800	92,600	66,300	158,900	*1,542	*4,321		*5,863	17,829
1801	81,000	82,600	163,600	8,175	9,229	3,196	20,600	17,413
Totals	....	....	....	57,146	85,139	3,196	145,481	226,506
Annual Average	....	....	122,900	6,950	10,102	....	17,052	28,313
				exclusive of A.D. 1800			exclusive of A.D. 1800 and desertion	
Annual Ratio to 1,000 Mean Strength	....	....	....	58·69	85·30	....	143·99	230
1802	67,400	70,300	137,700	4,417	27,139	3,383	34,939	7,405
1803	76,800	48,800	125,600	5,208	6,458	4,404	16,070	11,253
1804	97,800	48,700	146,500	6,119	4,598	5,468	16,185	11,088
1805	103,800	67,700	171,500	6,833	4,320	7,081	18,242	23,545

1810	86,500	138,600	225,100	13,597	4,627	4,729	22,953	21,095
1811	73,900	154,800	228,700	13,448	3,986	5,026	22,460	22,925
1812	70,700	171,500	242,200	16,317	3,738	5,918	25,973	24,359
Totals	....	....	....	101,580	44,615	55,614	201,809	229,732
Annual Average	91,300	106,900	198,200	10,158	4,462	5,561	20,181	22,973
Annual Ratio to 1,000 Mean Strength	....	....	....	51·25	22·51	28·06	101·82	115·90
1813	65,900	185,000	250,900	*15,012	* 3,621	*5,822	*24,455	14,698
1814	63,700	190,300	254,000	*12,502	*34,293	*8,857	*55,652	7,989
1815	....	....	208,700	* 8,124	*29,342	*7,383	*44,849	15,279
	....	....	....	*35,638	*67,256	*22,062	*124,956	37,966
General Totals				198,781	224,149	84,255	507,185	501,609
Estimated number of Recruits raised for Foreign and Colonial Corps				....	....	....	....	198,630
Estimated additions for defective returns				5,079	2,231	18,370	25,680	....
				203,860	226,380	102,625	532,865	700,239
Estimated deductions for men transferred from one corps to another				....	10,891	....	10,891	10,891
Total Estimate for Cavalry and Infantry				203,860	215,489	102,625	521,974	689,348
Estimated additions for Artillery and Engineers				15,560	13,652	10,648	39,860	58,322
				219,420	229,141	113,273		
Estimated additions for Prisoners of War							20,000	....
Effective strength in Cavalry, Infantry, Artillery, and Engineers — On the 1st January, 1793							581,834	747,670
Effective strength in Cavalry, Infantry, Artillery, and Engineers — On the 1st January, 1816							....	45,440
							211,276	....
							793,110	793,110

TABLE II.

Showing the Effective Strength and Casualties in Action of the Regular Army, including Cavalry, Infantry, and Artillery, (but exclusive of Militia,) in the Years 1793 *to* 1801, *and* 1803 *to* 1815. (*Actual Period of Hostilities* $20\frac{45}{100}$ *Years*).

Year.	Commissioned Officers.				Non-Commissioned Officers and Rank and File.				Total Casualties, all Ranks.
	Estimated Average Effective Strength.	Killed.	Wounded.	Total Casualties.	Average Effective Strength deduced from the Returns of the Adjutant-General.	Killed.	Wounded.	Total Casualties.	
1793...	3,576	14	41	55	74,500	167	609	776	831
1794....	5,425	29	100	129	113,100	526	1,547	2,073	2,202
1795....	6,467	8	34	42	134,700	104	533	637	679
1796....	5,966	8	67	75	124,300	217	709	926	1,001
1797....	5,722	3	8	11	119,200	35	92	127	138
1798....	6,014	3	4	7	125,300	31	62	93	100
1799....	7,085	31	208	239	147,600	558	2,822	3,380	3,619
1800....	8,141	....	5	5	169,600	16	63	79	84
1801....	8,395	22	170	192	174,900	507	2,782	3,289	3,481
1802....	Peace	....	....	....	....	....	....	....	....
1803....	6,620	25	47	72	137,900	322	973	1,295	1,367
1804....	7,781	1	16	17	162,100	63	194	257	274
1805....	9,101	9	47	56	189,600	157	855	1,012	1,068
1806....	10,037	4	31	35	209,100	141	564	705	740
1807....	10,722	32	125	157	223,800	671	1,576	2,247	2,404
1808....	11,846	9	59	68	246,800	239	918	1,157	1,225
1809....	12,235	63	302	365	254,900	1,317	5,185	6,502	6,867
1810....	12,158	19	108	127	253,000	273	1,197	1,470	1,597
1811....	12,043	80	434	514	258,400	1,548	6,382	7,930	8,444
1812..	12,864	131	640	771	268,000	1,867	8,149	10,016	10,787
1813....	13,248	168	955	1,123	276,000	2,804	13,958	16,762	17,885
1814....	13,241	90	604	694	275,700	1,488	7,218	8,706	9,400
1815....	11,040	171	680	851	230,000	2,341	9,005	11,346	12,197
Total..	....	920	4,685	5,605	....	15,392	65,393	80,785	86,390
Avrge.	9,078	....	....	....	189,200	....	....	....	....

Land Battles.

Unsuccessful Actions marked thus (*). § Numbers not ascertained.

Date.	Battles.	Nature of.	British. Total Strength in Officers and Men Engaged.	British. Casualties. Killed.	Wounded.	Total.	Per 1,000 Engaged.	British. Estimated Deaths. Total.	Per 1,000 Engaged.	British and Allies. Total Strength in Officers and Men Engaged.	Casualties. Total Killed and Wounded.	Per 1,000 Engaged.
1801. March 21	Alexandria	Defensive	14,000	243	1,193	1,436	103	393	28·1	....	....	....
1806. July 4	Maida	Offensive	5,675	45	282	327	58	87	15·3	....	....	....
1808. Aug. 21	Vimièro	Do.	19,200	135	534	669	35	215	11·2	§	§	§
1809. Jan. 16	Corunna	Defensive	16,700	158	634	792	47	257	15·4	....	....	....
,, July 28	Talavera	Do.	22,100	801	3,913	4,714	213	1,455	65·8	56,000	6,268	112
1810. Sept. 27	Busaco	Do.	27,800	106	500	606	22	183	6·6	57,000	1,300	23
1811. March 5	Barosa	Offensive	5,230	202	1,040	1,242	237	360	68·8	14,500	1,610	111
,, May 5	Fuentes d'Onore	Defensive	22,900	170	1,043	1,213	53	379	16·6	35,200	1,469	42
,, ,, 16	Albuera	Do.	9,000	882	2,672	3,554	395	1,358	151·0	37,000	6,500	176
1812. July 22	Salamanca	Do.	30,500	388	2,714	3,102	102	770	25·2	54,200	4,964	92
1813. June 21	Vittoria	Offensive	42,000	501	2,807	3,308	79	890	21·2	95,800	4,829	50
,, July 25 to Aug. 2	Pyrenees	Defensive	30,000	559	3,693	4,252	142	1,197	39·9	65,000	6,540	101
,, Nov. 10	Nivelle	Offensive	47,600	277	1,777	2,054	43	675	14·2	90,600	2,621	29
1814. Feb. 27	Orthes	Do.	27,000	210	1,411	1,621	60	404	15·0	43,600	2,200	50
,, April 10	Toulouse	Do.	26,800	312	1,795	2,107	79	582	21·7	54,400	4,641	85
1815. Jan. 8	*New Orleans	Do.	6,000	386	1,516	1,902	317	625	104·2	....	....	....
,, June 16	Ligny	Defensive										
	Quatre Bras	Do.										
,, ,, 18	Waterloo	Do.	49,900	2,126	8,140	10,266	206	3,245	65·0	230,600	36,590	159
	Wavre	Do.										
1854. Sept. 20	Alma	Offensive	26,800	353	1,619	1,972	74	559	20·9	55,000	3,545	64
,, Nov. 5	Inkermann	Defensive	9,000	632	1,878	2,510	279	883	98·1	§	§	§
				8,486	39,161	47,647					83,077	
Estimated deaths among the wounded			....	4,894								
Estimated casualties among the missing			....	1,137	....	2,274	....	....	....	....	3,787	
Aggregate numbers			438,205	14,517	....	49,921	114	14,517	33·0	888,900	86,864	98

Table IV.

Sieges.

(§) Numbers not ascertained.

Undertaken by	Place.	Commenced upon	Duration in Days.	Result.	Besiegers. Force.	Besiegers. Casualties. Killed.	Wounded.	Total.	Per 1,000 Engaged.	Estimated Deaths from Casualties. Total.	Per 1,000 Engaged.	Garrisons. Force.	Casualties. Total.	Per 1,000 Engaged.
British	Louisbourg	15 July, 1758	11	Capitulation	13,100	165	354	519	40	217	17·0	2,800	§	§
„	Havana	12 June, 1762	60	Capitulation	13,800	296	650	946	69	392	28·4	§	§	§
„	Monte Video	28 Jan., 1807	5	Taken by assault	4,000	142	421	563	141	203	50·8	§	§	§
„	Buenos Ayres ...	5 July, „	2	*Assault repulsed*	7,800	316	674	990	127	416	53·3	§	§	§
„	Flushing	3 Aug., 1809	12	Capitulation	17,000	71	373	444	26	121	7·1	5,800	§	§
British & Allies	Badajoz (1st)....	16 May, 1811	11	*Assault repulsed*	16,700	218	1,017	1,235	74	359	21·5	3,700	§	§
„ „	Ciudad Rodrigo..	8 Jan., 1812	11	Taken by assault.....	16,600	178	818	996	60	291	17·5	1,764	300	170
„ „	Badajoz (2nd) ...	16 Mar., „	21	Taken by assault.....	25,800	1,035	3,789	4,824	187	1,569	60·8	4,870	*1,600	328
British	Almaraz (Forts)..	19 May, „	1	Taken by assault.....	6,000	33	144	177	30	53	8·8	1,000	§	§
British & Allies	Salamanca (Forts)	17 June, „	10	Capitulation	4,000	99	331	430	108	146	36·5	800	100	125
„ „	Burgos	19 Sept., „	32	*Assault repulsed*	13,500	509	1,555	2,064	153	731	54·1	2,000	639	320
„ „	St. Sebastian (1st)	11 July, 1813	14	*Assault repulsed*	11,600	204	771	975	84	312	26·9	..	..	..
„ „	„ (2nd)	24 Aug., „	7	Taken by assault	11,000	967	2,478	3,445	313	1,328	120·7	3,200	*1,700	531
British	Bergen-op-Zoom..	8 Mar., 1814	1	*Assault repulsed*.	3,300	174	726	900	272	276	83·6	2,700	460	170
		Average..	14⅐	Aggregate results ..	164,200	4,407	14,101	18,508	113	6,414	39·0	§	§	§
British & Allies	Sebastopol	5 Oct., 1854	338	*British assault repulsed* / French successful	50,000	1,516	7,445	8,961	179	2,545	54·1	§	§	§
					214,200	5,923	21,546	27,469	131	8,959	42·0	§	§	313
French	Saragossa (1st)...	30 June, 1808	41	*Siege abandoned*	15,570	..	..	3,500	225	§	§	..	3,000	§
„	„ (2nd)...	29 Dec., „	54	Capitulation	43,200	§	§	3,000	69	§	§	31,000	22,800	735
„	Ciudad Rodrigo..	15 June, 1810	24	Capitulation	28,100	182	1,048	1,230	44	§	§	5,300	*1,800	340
„	Badajoz	28 Jan., 1811	41	Capitulation	17,000	§	§	1,600	94	§	§	9,000	*2,000	222
„	Tarragona	1 June, „	28	Taken by assault	21,500	§	§	4,209	196	§	§	13,200	*4,000	303
„	Tarifa.....	22 Dec., „	24	*Assault repulsed*	10,400	§	§	517	50	§	§	2,500	51	20
„	Antwerp	29 Nov., 1832	24	Capitulation	66,500	108	695	803	12	§	§	4,470	491	110
		Average..	33⅝	Aggregate results..	202,270	§	§	14,859	73	§	§	§	34,142	476

* Include losses from sickness.

TABLE V.

Showing the Proportion of Deaths to Casualties among Officers only.

		Killed.	Wounded.	Died of Wounds.	Total Casualties.	Total Deaths.	Proportion of Total Deaths to 1,000 Casualties.
Drinkwater	Siege of Gibraltar	5	35	1	40	6	150·0
Stewart	42nd Regiment	22	97	7	119	29	244·0
	79th ,,	11	69	4	80	15	187·5
	92nd ,,	12	100	13	112	25	223·0
Alcock	Auxiliary Legion	20	197	16	217	36	166·0
Edmonds	Talavera	32	195	13	227	45	198·0
	Salamanca	34	188	14	222	48	216·0
	Vittoria	25	167	22	192	47	245·0
	Orthes	16	134	7	150	23	153·0
	Waterloo	143	585	48	728	191	262·5
Crimea	Official Return	91	241	20	332	111	334·3
	Total	406	1,973	164	2,379	570	288·9

TABLE VI.

Returns showing the Proportion of Sick in the British Army in the Peninsula at the undermentioned Dates.

Date of Return.	Total Strength, including Sick.	Number of Sick.	Proportion Sick of 1,000 Total Strength.
1808.			
October 1	33,129	3,470	105
1809.			
April 22	21,597	2,038	94
May 1	24,227	2,357	97
June 25	26,995	3,246	120
July 1	35,410	4,827	136
September 25	35,018	8,827	253
October 11	33,000	7,800	236
November 14	30,000	9,000	300
1811.			
January 20	39,454	6,715	170
April 25	37,813	9,298	246
July 25	56,933	12,277	216
October 1	57,781	19,088	330
1812.			
January 8	50,994	12,255	240
,, 25	58,664	13,405	229
April 5	46,751	12,016	257
July 25	62,087	17,033	274
1813.			
January 25	65,644	17,513	267
July 25	63,868	12,698	199
1814.			
January 25	67,121	14,144	211
Average	44,500	9,300	209

TABLE VII.

Returns showing the Proportion of Sick in the French Army in Spain at the undermentioned Dates.

Date of Return.	Total Strength, including Sick.	Number of Sick.	Proportion Sick of 1,000 Total Strength.
1808.			
October 10	319,690	37,419	117
,, 25	318,934	34,558	108
November 15	335,223	45,107	135
1809.			
October 1	237,330	46,109	194
1810.			
July 15	356,729	47,743	134
August 15	353,918	46,982	133
1811.			
January 15	361,838	48,831	135
April 15	331,776	40,079	121
August 1	372,841	42,433	114
1812.			
January	325,000	42,056	129
April	291,000	34,369	118
May 15	292,000	31,227	107
1813.			
March 15	231,000	30,395	132
July 1	181,000	18,654	103
September 15	173,000	28,241	164
Average	299,000	38,870	130

TABLE VIII.

Showing the Proportion of Sickness and Mortality among the Troops employed in the Expedition to the Scheldt in the Year 1809.

Week ending	Officers.				Non-Commissioned Officers and Men.			
	Proportion to 1,000 Strength.			Proportion of Weekly Deaths to 1,000 Sick.	Proportion to 1,000 Strength.			Proportion of Weekly Deaths to 1,000 Sick.
	Of Sick.	Of Weekly Mortality.	Of Equivalent Annual Mortality.		Of Sick.	Of Weekly Mortality.	Of Equivalent Annual Mortality.	
10th Sept. 1809	No return	5·20	270	....	388	12·09	629	31·82
17th ,, ,,	307	9·15	476	29·79	468	15·92	828	34·02
24th ,, ,,	244	3·84	199	15·70	533	17·49	910	32·78
1st Oct. ,,	230	2·64	137	11·62	565	15·72	817	27·83
8th ,, ,,	186	4·17	217	17·85	587	14·21	739	24·19
24th ,, ,,	173	None	....	....	549	9·83	571	17·92
31st ,, ,,	135	1·69	88	12·50	530	10·31	546	19·43
14th Nov. ,,	81	None	....	....	428	4·51	235	10·53
21st ,, ,,	87	Do.	....	....	155	4·54	236	29·36
28th ,, ,,	78	Do.	....	....	185	4·79	249	25·90
Average	166	3·48	181	8·75	470	12·30	640	25·38

Abstract of the Returns of Killed and Wounded of the British Army in the Crimea, 20th September, 1854, to 8th September, 1855.

		Killed.							Wounded.							Total Casualties.	
		Staff.	Artillery, Engineers, and Train.		Cavalry.		Infantry.		Staff.	Artillery, Engineers, and Train.		Cavalry.		Infantry.			
		Officers.	Non-Commissioned Officers.	Non-Commissioned Officers and Rank and File.	Officers.	Non-Commissioned Officers and Rank and File.	Officers.	Non-Commissioned Officers and Rank and File.	Officers.	Officers.	Non-Commissioned Officers and Rank and File.	Officers,	Non-Commissioned Officers and Rank and File.	Officers.	Non-Commissioned Officers and Rank and File.	Officers.	Non-Commissioned Officers and Rank and File.
	1854.																
Battles	Sept. 20. Alma	1	3	9	..	..	23	318	7	1	21	1	..	78	1,518	114	1,866
	Oct. 25. Balaklava	2	1	6	10	159	..	..	4	2	27	21	197	..	..	40	389
	Nov. 5. Inkermann	5	2	16	1	4	35	569	11	4	79	..	5	85	1,694	143	2,367
	Total Loss in Battles	8	6	31	11	163	58	887	22	7	127	22	202	163	3,212	297	4,622
Siege of Sebastopol. Assaults.	1855.																
	June 7. Quarries	..	1	8	..	..	10	98	..	2	45	..	..	34	466	47	617
	„ 18. Redan	1	3	11	..	..	17	219	3	4	26	..	..	63	1,114	91	1,370
	Sept. 8. The same	..	1	8	..	..	27	348	6	5	39	..	..	113	1,724	152	2,119
	Total Loss in Assaults	1	5	27	..	..	54	665	9	11	110	..	..	210	3,304	290	4,106
Ordinary Siege Operations.	1854 and 1855.																
	Sept. 21 to Oct. 24	..	..	11	..	..	3	41	..	1	71	..	..	12	205	16	328
	Oct. 26 „ Nov 4	..	1	4	..	..	1	22	..	1	11	..	..	..	43	3	80
	Nov. 6 „ June 5	..	6	35	..	..	10	278	..	14	119	..	..	32	1,154	62	1,586
	June 8 „ „ 17	..	..	12	..	..	..	39	..	3	50	..	..	8	236	11	337
	„ 19 „ Sept. 7	..	2	29	..	..	7	263	1	10	124	..	..	42	1,664	62	2,080
	Total	..	9	91	..	..	21	643	1	29	375	..	..	94	3,302	154	4,411
	Total Siege	1	14	118	..	..	75	1,308	10	40	485	..	..	304	6,606	444	8,517
	General Total	9	20	149	11	163	133	2,195	32	47	612	22	202	467	9,818	568	10,632
	Killed								9	20	149	11	163	133	2,195	173	2,507
	Killed and Wounded								41	67	761	33	365	600	12,013	741	13,139
	Grand Total								41	828		398		12,613		13,880	

The Bank of England; its present Constitution and Operations. By Charles Jellicoe, Esq., *Fellow of the Statistical Society.*

[Read before the Statistical Society, 17th March, 1856.]

There seems to be a very general impression on the mind of the public that the fluctuations which occur from time to time in the amount of the circulation, or in the demand for it, and the evil consequences resulting from them, are to be traced to the present constitution, or to the operations of the Bank of England, and that, therefore, the interference of the Legislature is again required to avert these evils, and to place that establishment on a sounder basis.

It is proposed, therefore, in the present paper, briefly to inquire into the nature and character of the constitution and operations in question, and, if possible, to determine whether the impression above mentioned be a correct one, and whether they are, in any degree, chargeable with the financial disturbances which occasionally affect the monetary world in so serious a manner.

The Bank of England was established in the year 1694 by a charter from King William and Queen Mary, and its first capital was created by a subscription in that year of 1,200,000*l.* By successive aggregations this sum has been increased to the enormous extent of 14,553,000*l.*, which now forms its capital stock, and which is actually paid up. It differs from other banking companies in possessing certain privileges, and also in the following particulars.

It has the management of the issue of bank notes and of the national debt, and it acts more particularly in the capacity of banker to the Government, receiving the revenue and paying the drafts drawn in liquidation of the general expenses of the State.

Under the provisions of the Act of 7 and 8 Victoria, cap. 32, the accounts are directed to be kept in a peculiar manner, and to be published weekly in the following form:—

*Issue Department.**

	£		£
Notes issued	24,580,570	Government Debt	11,015,100
		Other Securities	2,984,900
		Gold Coin and Bullion	10,580,570
			24,580,570

*Banking Department.**

	£		£
Proprietors' Capital	14,553,000	Government Securities....	10,275,480
Rest	3,185,588	Other Securities	18,868,757
Public Deposits	4,439,589	Notes	5,505,485
Other Deposits	12,234,788	Gold and Silver Coin	646,537
Seven Day Bills.....	883,294		
	35,296,259		35,296,259

* The figures here given are those actually presented in the account for the week ending 1st December, 1855.

It will here be seen that the issue department is entirely distinct from the banking one, and that the former takes account simply of the securities and specie kept to meet the notes in circulation. By the Act of Parliament above quoted, all persons may demand from this department notes in exchange for gold bullion at the rate of three pounds seventeen shillings and ninepence for each ounce of standard gold; and, accordingly, it will be observed that at the date of the above account the public, including the bank itself, had obtained notes in this way to the extent of 10,580,570*l.*, in other words, that they had deposited upwards of 2,683,380 ounces of standard gold, receiving notes at the rate above mentioned in exchange for it. But a slight inspection of the amount will show that a further quantity of notes, representing a sum of 14,000,000*l.*, were also at that time in the hands of the public; and the questions will naturally arise, how they came there, and what equivalent was given for them? It appears that the securities to meet them, should they be presented, consist of a sum of 11,015,100*l.*, described as a Government debt, and 2,984,900*l.* made up of "other securities." But these being, for the most part, wholly inconvertible, would, of course, entirely fail of their object should they at any time be called into requisition.

The arrangement, as we have said, owes its origin to the celebrated enactment generally known as the Bank Charter Act, which specially authorized the appropriation of 14,000,000*l.* of securities (the debt due to the bank of 11,015,100*l.* forming part of them), to this particular purpose, that is to say, that on the creation of the two departments the bank had not the means of allotting an amount of specie to the issue department equal to that of the notes in circulation, (as it would seem only reasonable and proper that it should have done,) and therefore the deficit was necessarily made up in the manner described, the authors of the plan justifying it, it is to be presumed, partly on the necessity of the case, and partly on the well-established fact that, except on very extraordinary occasions indeed, the circulation was not likely to fall below such a limit as would exhaust the supply of gold, slender as it comparatively was, whilst the precious metal was thus economised to a very considerable extent, and other important advantages obtained, to which we shall hereafter have occasion more particularly to refer. It will be noticed then, that this department of the bank is entirely passive, and that the directors, excepting so far as they are holders of notes in the other department, can exercise no control over it. It is subject simply to the action of the public, who, in effect, use it as a depository for their gold, leaving it or withdrawing it at their pleasure, and without charge, save for the conversion of bullion into coin, for which they pay at the rate of 1½*d.* per ounce. It is to be observed, too, that in this branch, whatever the amount of notes in circulation may be, the securities must never exceed the 14,000,000*l.* above mentioned unless under the authority of an Order in Council;* and further, that the silver bullion must not be more at any time than one-fourth part of the gold coin and bullion, representing with it and such securities the total amount of notes issued. And thus it will be seen that as the

* Such an order has recently been issued, increasing the 14,000,000*l.* to 14,475,000*l.*

amount of such notes increases that of the specie must also increase, and *vice versâ.*

We now come to the consideration of the conditions of the banking department, and we may premise that there is no reason why this branch of the bank should differ in its general characteristics from any other company established for the like purpose, due allowance being made for the difference in its general calibre. Of the total liabilities, amounting to 35,000,000*l.* and upwards, it will be observed that 17,557,661*l.*, being made up of public and private deposits, may be withdrawn by the owners at their option, and (with slight exception) without notice; the remainder, 17,738,588*l.*, being the property of the proprietors, to be dealt with by them only at their general meetings, and subject to their regulations. On the credit side of the account there appear to be 29,144,237*l.* invested in securities (it is to be presumed) more or less available, the remainder, 6,152,022*l.*, consisting of notes and of gold and silver coin, of course forthcoming immediately they may be wanted. This state of things may remain, or may be changed in a variety of ways by the action of the public, or by that of the bank itself. Thus the notes and specie may be indefinitely increased by the deposits of customers, or they may entirely disappear by the withdrawal of such deposits. If the withdrawers be satisfied with notes, then the issue department is unaffected, but, if they require gold, then the banking department must obtain it from the issue department in exchange for the notes held by the former; and there will be a simultaneous decrease of circulation and specie in the one, and of notes and deposits in the other. Thus, if we suppose that at the date of the above account depositors required 6,152,022*l.* of their deposits, and wanted specie for it, the banking department would be left with nothing but its securities, whilst the issue department would exhibit a decrease of 5,505,485*l.* in the circulation on the one side, and of precisely the same sum in the gold coin on the other. In like manner a deposit of gold in the banking division finds its way into the department for issue; a corresponding amount of notes appearing to the credit of the former, and to the debit of the latter.

Such are the modes in which the public act upon this great establishment, and we have next to consider in what way it may be affected by its own operations. These consist simply of a conversion of specie or notes into securities, and of the reverse, viz., of the realisation of securities, and re-conversion of them into notes and specie; and, as it is, of course, out of these operations that the profits of the bank arise, we may naturally expect to see the ratio of securities to specie at all times as high as possible. Accordingly, it will be found, by reference to our statement, that the former were more than four times the amount of the latter at the time to which it refers. It is the keeping up such a proportion which exercises the skill of a banker; and it is his peculiar business, whilst the investments are at their highest possible amount, to have them available at the shortest possible notice.

Having now briefly examined the action of these two departments under ordinary circumstances, I proceed to investigate it when its course is disturbed by influences of an unusual character, such, for

instance, as a continuous demand upon the gold in its coffers, and which we have no difficulty in perceiving may arise from three distinct sources; that is to say, the demand may come from the holders of notes, or from the depositors, or from persons borrowing on securities. And it is observable, that, as regards the first two sources, the bank itself has no control whatever, while, as respects the last, it can, of course, exercise such restraining power as it may deem desirable and expedient.

Let us now suppose that the note-holders are desirous of recovering the gold belonging to them, and that a gradual stream of claimants of this class sets in. We see that to the extent of 10,580,570*l.* they can be satisfied, but that there the supply must stop unless the securities in this branch can be realised. If, on the other hand, the demand arise on the part of the depositors, they can be satisfied to the extent only of 646,537*l.*, without encroaching on the supply of the issue department, and without a sale of securities. Under such circumstances, the advance of specie on a further deposit of securities would seem to be out of the question, unless it appear that the demand arises on the part of the depositors and borrowers only, for then the bank may venture to use the notes in the banking department, or, in other words, may avail itself of about half the bullion belonging to the note-holders, always, be it understood, at the risk of so small a remainder tending to create alarm, and a further demand for gold from both classes. It is here, however, especially to be observed that, under the existing arrangements, the banking department can never avail itself of specie in this way beyond the amount of the notes in its possession, so that had the out-of-doors circulation at the date of our statement been ever so large, and the quantity of bullion of course correspondingly great, the utmost that the banking department could have obtained from it would be the 5,505,485*l.* standing to its credit in notes. It is this feature which peculiarly distinguishes the present arrangement from that which obtained previously, and which will best appear from the following short statement, exhibiting the same account as that above given, made out in the old form:—

Liabilities.	£	Assets.	£
Circulation	19,958,379	Securities	28,591,237
Public Deposits	4,439,589	Bullion	11,227,107
Private	12,234,788		
Rest	3,185,588		
	39,818,344		39,818,344

This account differs from the one first given only in the omission of the capital of 14,553,000*l.* on the one side, and the same amount of securities on the other, and also in the abstraction of the 5,505,485*l.* notes appearing on both sides of the other account, but it involved a most important difference in practice. When this form prevailed, no portion of the bullion was set apart exclusively on account of the circulation, and consequently the whole of it was available for whatever purpose was most pressing; thus, supposing the circulation at the time referred to to have been stationary, the whole 11,227,107*l.* *could* have been used either to meet the claims

of depositors, or for advances or discount; whereas not half that amount, as we have seen, was really so applicable under the existing arrangements.

This is the restriction which has given rise to so much dissatisfaction in the mercantile world, and the abolition of which is so earnestly advocated by Mr. Tooke, Mr. Newmarch, and some others, whose opinions, like theirs, are worthy of the highest consideration. These gentlemen argue, that, were it not for this separation of the departments, the supply of bullion would, under any ordinary circumstances, be sufficient for all purposes. That the separation has given rise to an antagonistic action between the two departments, and that the variations in the rate of discount have been greater and more frequent in consequence of it; whilst the power of the bank to accommodate the public in times of difficulty is seriously diminished. That the liability arising from the circulation and that from the deposits are of similar character, and that there is no ground for the distinction between them, which the supporters of the measure have set up. On the other hand, it is urged by such weighty authorities as Lord Overstone, the late Sir Robert Peel, and others, that the regulation of the circulation is properly a function of the Government, and ought not to be unrestrainedly in the hands of a company or set of individuals. That the separation is essential for preserving the convertibility of the bank-note, and that by its means this form of paper money fluctuates in quantity, just as the gold which it represents would do were it not so represented, and lastly, that there is no undue interference, inasmuch as the directors are left to manage the banking department entirely at their own discretion.

Without dwelling in more detail on these conflicting opinions, let us endeavour to determine how the case really stands; and for this purpose, and with the aid of the very valuable table published in Mr. Tooke's recent work on the Bank Charter, and prepared, as we learn on that gentleman's authority, by Mr. Newmarch, let us briefly examine what the state of the bank's finances have been at given times since the passing of the Act in 1844. It will be convenient, with this object, to select the 20th January, 1853, when the circulation was about at the highest, and the 15th June, 1848, when it was at the lowest, and we will take also the 15th April, 1847, and the 26th December, 1850, when the deposits were in their turn at a very low and a very high range respectively.

Issue Department.

1853.		£		£
Jan. 20.	Circulation	23,470,000	Securities	14,000,000
			Bullion	9,470,000

Banking Department.

	£		£
Deposits	20,170,000	Securities	27,450,000
Capital, &c.	17,210,000	Bullion	9,930,000
	37,380,000		37,380,000

Issue Department.

1848.		£		£
June 15.	Circulation	17,380,000	Securities	14,000,000
			Bullion	3,380,000

Banking Department.

	£		£
Deposits	16,080,000	Securities	22,680,000
Capital, &c.	17,410,000	Bullion	10,790,000
	33,490,000		33,470,000

Issue Department.

1850.		£		£
Dec. 26.	Circulation	18,570,000	Securities	14,000,000
			Bullion	4,570,000

Banking Department.

	£		£
Deposits	21,430,000	Securities	28,140,000
Capital, &c.	17,100,000	Bullion	10,390,000
	38,530,000		38,530,000

Issue Department.

1847.		£		£
April. 15.	Circulation	20,250,000	Securities	14,000,000
			Bullion	6,250,000

Banking Department.

	£		£
Deposits	13,910,000	Securities	28,230,000
Capital, &c.	18,600,000	Bullion	3,080,000
	31,310,000		31,310,000

From these statements we perceive that, amidst the various fluctuations they exhibit, there is either something like a glut of gold in both departments, or that, when a scarcity arises in one, there is at least a sufficient if not an ample supply in the other, and *vice versâ*; or if we compare the relative strength of the two departments, as shewn by their power to meet a run upon them, we find them to be at each epoch in the ratios of 40 : 69, 29 : 67, 25 : 48, and 31 : 22. These conditions, it will be observed, have reference to such changes in the affairs of the bank as are not controllable by the managers. If we pretermit that consideration, and select epochs at which the advances made by the directors are heavy or otherwise, we shall still arrive at the like results: thus, let us take the 25th October, 1847, and the 22nd November, 1849, and we shall find in the

Issue Department.

1847.		£		£
Oct. 25.	Circulation	20,320,000	Securities	14,000,000
			Bullion	6,320,000

Banking Department.

1847.		£		£
Oct. 25.	Deposits	13,340,000	Securities	29,810,000
	Capital, &c.	18,460,000	Bullion	1,990,000
		31,800,000		31,800,000

Issue Department.

1849.		£		£
Nov. 22.	Circulation	18,010,000	Securities	14,000,000
			Bullion	4,010,000

Banking Department.

		£		£
	Deposits	17,550,000	Securities	23,440,000
	Capital, &c.	18,260,000	Bullion	12,370,000
		35,810,000		35,810,000

So that, although at one time the bullion is reduced in one department to less than two millions, and at another to little more than four, yet it will be seen that in both departments there was no less at the two epochs than 8,310,000*l.* and 16,380,000*l.* respectively. Hence we come to the conclusion that the division of the bank into the two branches must necessarily have greatly crippled its action; in short, the operation, if we consider the steadiness of the circulation and that of the deposits to be nearly on a par, was little else than making two nearly equal banks out of one, with permission to deal with the assets in the one case, and with a prohibition to touch them in the other. Thus, at the date of the account we have so often quoted, the two departments were constituted as follows:—

Issue Department.

	£	
Securities	14,000,000	73
Bullion	5,075,085	27
	19,075,085	100

Banking Department.

	£	
Securities	11,405,649	65
Bullion	6,152,022	35
	17,557,671	100

Both Departments.

	£	
Securities	25,405,649	69
Bullion	11,227,107	31
	36,632,756	100

So that at the time at which this state of things existed the banking powers of the establishment were clearly little more than

half what they would have been in a similar state before the separation; and the same, or nearly the same, may be said, whatever the particular condition of the finances may happen at any time to be.

But whilst, on the one hand, these manifest disadvantages presented themselves, on the other, a new description of paper money was created, affecting in reality to be no other than a certificate that the holder of it had so much gold deposited, which he could possess himself of whenever he pleased; and the new security, throwing off its previous infirmities, thus aimed to be unassailable by the consequences either of misfortune or mismanagement. It is true that the conditions which were to perfect this plan were but half fulfilled, and that if the Government desired to give the bank-note a new character, it would seem to be the proper course to have paid at once its debt to the bank proprietors — to have claimed from them an amount of specie equal to the then circulation, and thereupon to have substituted Government notes for those outstanding;— nevertheless, up to a certain limit, the object contemplated was secured, and since it is only under such an arrangement as the issue department shadows forth, that this description of paper money can exist, it is clear that if we wish to retain the one we cannot abandon the other. Considering, then, the apparently unavoidable liability of all banking and mercantile establishments to misfortune and mismanagement, it does seem most desirable that the country should have at least one description of paper money free from the hazards which any dependence upon them must entail, and that therefore the present arrangement, as regards the issue department of the bank, should be maintained, unless, indeed, an improved version of it can be substituted. To be perfect, the amount of gold should be equal to that of the notes representing it—the sole objects of such an establishment being the supply of an entirely safe, convenient, and comparatively inexpensive medium of exchange to all persons desirous of obtaining the accommodation. Into such a system no thought of profit can enter—on the contrary, it must be somewhat costly, and it is no more than reasonable that it should be, and that those who avail themselves of its advantages should contribute mainly, if not wholly, to the expense of it. Meanwhile, since the creation of such an agency needs in no way interfere with the fullest development of the ordinary system of banking, some remedy is required for the condition of the other department, enfeebled as it undeniably is, by the severance of so considerable a portion of its former self: the one which naturally presents itself is an increase in its capital, and another is (as Mr. Tooke has so frequently urged), the retention of a larger amount of gold in its coffers—some compensation being made, as that gentleman suggests, for the reduction in profits which must ensue from such a retention.

Either of these expedients would enlarge the present powers of the bank, and enable the directors to accommodate more extensively the mercantile world in times of pressure; or if the Government would pay some portion (say three or four millions only) of its debt, reducing the large amount of securities in the issue department, and increasing proportionately the bullion there, the directors would, it is to be presumed, feel less apprehension than they appear to do

now, as the notes in their possession gradually disappear, and would probably be enabled to adjust their rates of discount with greater regularity and consistency than they have of late years succeeded in doing. In 1853 and in 1855 these rates were raised by gradations of half per cent., from three and a half per cent. to five and a half; and referring again to Mr. Newmarch's useful table, we find that the conditions contemporaneously existing were as follows:—

ASSETS.

Minimum Rates.	Banking Department.		Issue Department.		Public Securities.		Private Securities.	
	1853.	1855.	1853.	1855.	1853.	1855.	1853.	1855.
3½	8·83	12·52	9·42	5·54	13·12	12·68	14·08	11·85
4	8·02	8·07	8·48	6·15	12·77	13·08	14·00	16·08
4½	7·44	7·98	8·42	5·72	12·53	12·80	16·18	16·83
5	6·84	6·77	8·77	6·17	12·34	12·18	18·57	19·36
5½	4·63	5·99	7·98	6·29	12·57	18·57	14·19	19·24

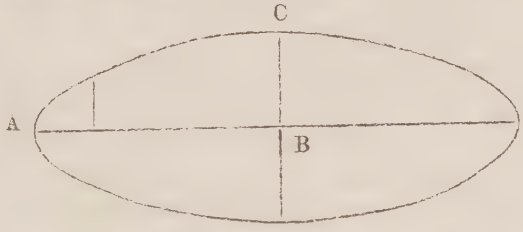
LIABILITIES.

Minimum Rates.	Public Deposits.		Private Deposits.		Circulation.	
	1853.	1855.	1853.	1855.	1853.	1855.
3½	4·63	5·59	12·90	13·31	24·81	20·57
4	4·70	7·59	11·02	10·97	23·91	21·13
4½	6·01	7·84	11·05	11·15	23·86	20·70
5	6·74	8·14	11·89	11·44	24·22	21·17
5½	2·34	7·11	10·69	10·84	23·14	21·30

We may perceive here, amongst other peculiarities, that when the rate of discount was raised in 1853 to 4 per cent., the bullion was 2,280,000*l.* more than when the same measure was adopted in 1855; and that there was an excess of 2,160,000*l.* when ½ per cent. more was demanded, and of nearly 2,700,000*l.* when the rate was further raised to 5 per cent. There are probably other considerations influencing these changes beside the absolute amount of gold in the coffers of the bank—but none, it is to be presumed, of sufficient importance to account for such discrepancies as are here exhibited.

There can be no doubt that the Bank of England is at all times the principal depôt for gold coin and bullion. There is a vast quantity beside in the country, but no other single stock which can at all compare with it. To ensure the retention of an adequate supply, it is obvious that its price should increase as it becomes scarcer, in accordance with the invariable law which appears to regulate all other

commodities. If such a law be not acted upon, a demand for the precious metals in other countries will speedily drain the bank coffers; nor will any process but an increased price here or a diminished one abroad replenish them. With almost all other commodities these fluctuations in price obey the imperious dictates of supply and demand, and require no artificial adjustment. But it is otherwise with the bullion in the Bank of England. If a demand arise for it, the directors advance their prices apparently without any rule, and depress them again with the like uncertainty when the demand ceases. They are the sole arbiters of its value, and the variations in it depend altogether on their decision; hence the inconveniences attending the natural fluctuations of price are exaggerated by changes which are wholly different at one time from what they would be, under the like circumstances, at another. Now, the obvious remedy for this would be the regulation of the price either by the quantity of gold simply, or by that element, and also by the intensity of the demand; and a convenient mode of effecting these objects suggests itself from the relations obtained in certain geometrical constructions, which, as Mons. Quetelet observes, may often be made available for such purposes with advantage. Let us take for instance the following one



as a means of solving our problem, and conceive that the line A B, being half the major axis of the ellipse, represents the gold in the banking department subject to the action of the public; C B the rate of discount to be charged when the whole quantity above mentioned is gone, and two millions only are left: then, if we assume the quantity of gold to be ten millions, and the maximum rate of discount 8 per cent., we easily find, by means of the equation to this figure,* that, as the gold diminishes, the rates of discount should advance as follows; that is to say, when it is reduced to

9,746,000	the rate should be	3 per cent.
8,660,000	,,	4 ,,
7,810,000	,,	5 ,,
6,633,000	,,	6 ,,
4,899,000	,,	7 ,,
2,000,000	,,	8 ,,

If it be desired to regulate the price by the intensity of the demand as well as by the fluctuation in quantity, this may be done in a practical way by increasing the maximum rate, by which means all the intermediate rates will also be increased: or the reverse process may be resorted to where the demand is not of an urgent kind. Of course great discretion would be required in determining

* $y^2 = \frac{b^2}{a^2}(a^2 - x^2)$ whence $x^2 = a^2 - \frac{y^2 a^2}{b^2}$.

what the maximum rate should be, but, that being done, the rest would follow as a natural consequence; and since, under some such system, the public would know what it had to expect, and would be able in a measure to anticipate the rates to be required from them for advances, there is reason to think that, were it adopted, less disturbance would arise than there now does when a demand for gold sets in, and that sudden and violent expansions and contractions of the currency would cease to occur.

The investigation we have now gone through, will, I think, serve to show that the Bank of England plays for the most part a passive character in the monetary world, and even during times of the greatest disturbance exercises influence only in the greater or less degree of facility with which it yields to the pressure from without. If the management be open to reprehension at all, it would seem to deserve it more on the score of undue reduction in its discounts than on any other grounds. Considering the nature of the security, there seems no good reason for rates of discount ever falling so low as 3 per cent. Short bills are no doubt peculiarly suited to the business of banking, but the evils immediately arising from an over-estimate of them, for this or any other purpose, ought to deter all thinking persons from purchasing the facilities they afford, or, in other words, making advances upon them at a rate which is sure to entail consequences more or less disastrous.

The graduation of the prices of bullion, or of the charges for the use of it, is, as we have seen, attended with peculiar difficulties, but not such as are altogether insurmountable. Considerable improvements might, there is reason to believe, be introduced on this head, and a system established which should as closely as possible imitate the fluctuations arising, under ordinary circumstances, from variations of supply and different intensities of demand. As regards the degrees to which the prices in question have been at various epochs raised by the Directors of the bank, it would seem that they have done no more than obey an imperious necessity. They have thus barely retained so much of the gold belonging to their customers as was not required by them at the moment, and surely that was going far enough. It is admitted on all hands that a banker is at liberty to use for his own advantage the moneys deposited with him, but it is a compact of almost a sacred kind that such moneys shall be forthcoming on the instant they are required; it is therefore especially incumbent upon him, above all things, to preserve intact the interests of his customers, and to resist, when absolutely necessary, the solicitations of borrowers, let the nature of their propositions be as tempting as they may. It must ever be borne in mind, too, that all bill giving and all bill discounting are no other than contrivances to make small capitals do the business of large ones; and that, although when kept within reasonable bounds, such contrivances are not unattended with advantage, there is yet a constant tendency in them to exceed their legitimate limits, and to entail distress and ruin on the mercantile community. It is true that they greatly accelerate our natural rate of progress, and enable us to anticipate by years the advantages for which we are continually labouring — but, were it not for their introduction, the

merchant, the tradesman, and the manufacturer, would pursue their less ambitious avocations in comparative freedom from anxiety, and the mercantile world would be unvisited by the panics and convulsions which now so frequently disturb its serenity.

A great deal has been written on the subject of the currency, and much pains taken to determine what forms of paper money are to be looked upon as of that character and what are not. It would seem to be a more simple view of the matter to regard them all as no other than securities for the payment of that which, from its peculiar nature, is most readily exchangeable, viz., the precious metal. For the most part they have no intrinsic value, but depend solely for that which they have on what they profess to do, and on the degreee of certainty with which we may look for a performance of what they promise. Thus a Bank of England note, if the bullion in the issue department were sufficient to meet all the notes in circulation, would be as nearly as possible a perfect security. It professes that the specie which it represents may be had in undiminished quantity immediately it is required, and no doubt could exist, under such circumstances, that the promise would be always punctually performed. A bill of exchange is evidently a similar security, but one of an inferior kind; it professes less, for the payment of it is not usually to be immediate, and the performance of what it does promise depends in the first instance on the solvency of the drawer and acceptor (although as the endorsements increase in number its validity necessarily improves), and on a strict adherence to certain legal forms. A check, although giving immediate power over the specie it is drawn for, is liable to be anticipated by the drawer, and to be rendered valueless by the failure of the banker; and so on, till we arrive at those forms of security recommended by gentlemen of a certain school, which, so far as we can learn, are to promise nothing definitely, and which can only retain a semblance of value under a system in which the precious metals are, by common consent, dispensed with as a medium of exchange. These, and a variety of others, are brought into existence in the operations of commerce, and so long as those only which are of a first-class character are generated, and that to a limited extent, commerce will be on a sound and wholesome basis.

The disorders which arise from time to time are simply evidences that these forms of security have been created in undue quantity or of inferior quality, and for the suppression of these the disorders themselves are absolutely necessary. Such periodical outbreaks are the inevitable concomitants of credit, and will never cease to arise so long as mankind continue to avail themselves of it, and are not content to carry on their transactions by means of commodities possessing intrinsic value, or of securities for realizing them of unimpeachable validity.

MISCELLANEA.

Aggregate Demands made through the Clearing House upon the Bankers who use the Clearing House on each day in the Year 1839, together with the Amount of Bank Notes employed in the Clearing House on the same day, omitting all Fractions under £100.

[From Appendix to Second Report, Banks of Issue, (1841).—No. 320*a*.]

No. of the Week.		Date.	Aggregate Demands.	Bank Notes.	Bank Notes Per Cent.	No. of the Week.		Date.	Aggregate Demands.	Bank Notes.	Bank Notes Per Cent.
Bank Disct. 4½ per ct.		Jan.	£	£				Mar.	£	£	
1		1	2,551,100	201,600	7·90	9		1	3,588,300	188,900	5·26
		2	1,694,200	184,300	10·90			2	4,653,000	199,600	4·29
		3	1,797,700	140,600	7·81			3	...	...	...
	1B	4	3,637,900	254,200	6·99	10	1B	4	4,291,300	317,100	7·39
		5	3,373,000	161,400	4·79			5	3,224,200	210,200	6·53
		6	...	...	...			6	2,344,000	294,400	12·58
2		7	2,661,700	177,800	6·69			7	2,343,200	196,400	8·39
		8	3,388,100	289,800	8·55			8	2,746,400	200,400	7·29
		9	3,238,200	593,300	18·31			9	3,451,500	239,000	6·93
		10	2,692,200	373,300	13·87			10	...	...	...
		11	2,717,300	172,600	6·35	11		11	2,512,900	207,500	8·27
		12	4,372,700	223,800	5·12			12	2,691,700	235,200	8·74
		13	...	...	...			13	2,410,000	256,300	10·64
3		14	2,857,200	313,800	10·97		FS	14	3,666,900	273,900	7·46
	FS	15	4,351,100	250,900	5·77			15	2,566,800	231,700	9·01
	ES	16	4,336,300	288,700	6·65			16	3,422,200	282,800	8·27
		17	3,039,100	180,800	5·95			17	...	...	...
		18	3,129,200	227,100	7·25	12		18	2,510,000	181,100	7·22
		19	3,808,000	232,800	6·11			19	2,361,300	206,400	8·75
		20	...	...	...			20	2,332,900	204,900	8·80
4		21	2,942,300	305,400	10·39			21	2,568,800	296,700	11·55
		22	3,293,800	207,700	6·31			22	2,916,800	175,400	6·01
		23	2,627,200	188,200	7·16			23	3,366,000	195,000	5·79
		24	2,166,000	223,300	10·29			24	...	...	...
		25	2,814,000	192,800	6·86	13		25	2,683,100	244,500	9·12
		26	3,551,600	244,000	6·88			26	2,779,000	176,700	6·36
		27	...	...	...			27	2,495,800	137,900	5·52
5		28	2,527,100	200,500	7·93		FS	28	4,447,000	243,700	5·48
		29	3,150,500	214,800	6·82			29	...	...	...
		30	2,374,500	128,100	5·41			30	3,506,100	225,800	6·43
	FS	31	3,670,400	176,200	4·82			31	...	...	...
			82,762,400	6,348,500					75,879,200	5,621,500	
		Feb.						April			
5		1	2,814,100	250,200	8·19	14		1	2,822,800	172,500	6·12
		2	3,888,000	243,400	6·26			2	2,722,800	191,300	7·04
		3	...	...	...			3	2,650,600	303,600	11·45
6	1B	4	5,107,900	331,700	6·50		1B	4	3,693,500	197,400	5·35
		5	3,475,200	249,400	7·19			5	2,710,800	247,400	9·13
		6	2,658,400	109,100	4·10			6	4,591,000	189,800	4·13
		7	2,528,800	174,100	6·88			7	...	...	...
		8	2,989,300	158,500	5·31	15		8	3,249,100	256,600	7·89
		9	3,622,400	223,500	6·17			9	3,434,400	213,200	6·22
		10	...	...	...			10	2,930,200	240,100	8·20
7		11	3,133,900	207,800	6·64		ES	11	3,842,000	321,000	8·36
		12	3,101,300	259,000	8·36			12	3,635,400	230,500	6·33
		13	2,598,300	232,300	8·94			13	3,930,400	189,900	4·83
	FS	14	4,018,800	181,200	4·50			14	...	...	...
		15	2,944,900	227,900	7·75	16	FS	15	4,734,500	285,300	6·03
		16	3,432,600	162,500	4·74			16	2,800,400	249,600	8·92
		17	...	...	...			17	2,850,600	237,400	8·33
8		18	2,708,200	192,200	7·09			18	3,648,900	263,200	7·21
		19	3,197,100	192,700	6·02			19	3,317,200	157,600	4·75
		20	2,608,200	133,700	5·12			20	3,631,900	197,700	5·45
		21	2,047,300	177,000	8·64			21	...	...	...
		22	2,499,400	118,100	4·72	17		22	2,880,300	302,600	10·51
		23	3,910,600	226,100	5·78			23	3,067,200	172,000	5·59
		24	...	...	...			24	2,212,000	227,200	10·28
9		25	2,535,800	282,200	11·11			25	2,536,400	171,300	6·75
	ES	26	4,027,700	253,700	6·30			26	3,401,600	277,600	8·17
		27	2,728,800	188,100	6·89			27	3,498,700	243,800	6·88
	FS	28	3,587,700	205,800	5·73			28	...	...	...
						18		29	2,730,100	134,000	4·92
							FS	30	4,316,400	166,400	3·85
			76,164,700	4,960,200					85,829,200	5,836,000	

ggregate Demands made through the Clearing House upon the Bankers who use the Clearing House on each day in the Year 1839, *&c.*—Continued.

. of he eek.		Date.	Aggregate Demands.	Bank Notes.	Bank Notes Per Cent.	No. of the Week.		Date.	Aggregate Demands.	Bank Notes.	Bank Notes Per Cent.
		May	£	£				July	£	£	
18		1	1,591,200	158,200	9·95	27		1	2,367,300	193,400	8·16
		2	3,031,800	213,500	7·04			2	2,940,100	250,100	8·50
		3	3,150,500	213,600	6·78			3	2,338,800	205,800	8·80
	IB	4	5,025,800	272,200	5·41		IB	4	3,103,300	218,100	7·03
		5	...	...	...			5	2,669,300	255,000	9·55
19		6	2,669,800	250,700	9·39			6	3,854,700	132,900	3·45
		7	3,555,500	249,400	7·03			7	...	...	...
		8	2,805,800	166,200	5·92	28		8	2,593,700	202,200	7·81
		9	2,082,200	108,000	5·19			9	3,585,600	373,000	10·39
		10	3,347,400	181,400	5·42			10	2,787,300	210,600	7·55
		11	3,617,300	189,400	5·23			11	3,713,100	341,200	9·20
		12	...	...	...			12	3,345,300	252,400	7·53
20		13	2,204,600	201,300	9·15			13	3,974,300	283,700	7·15
		14	3,073,200	232,300	7·57			14	...	...	...
		15	3,018,000	262,900	8·71	29	FS	15	4,160,300	237,100	5·70
	FS	16	3,530,000	134,700	3·82		ES	16	2,921,600	296,000	10·14
		17	2,760,000	224,800	8·15			17	4,099,200	317,500	7·75
		18	3,718,600	218,000	5·86			18	3,041,700	195,700	6·44
		19	...	...	...			19	2,956,500	234,700	7·93
21		20	2,306,000	186,600	8·08			20	3,170,100	181,400	5·72
		21	3,023,300	242,500	8·03			21	...	...	...
		22	2,605,300	210,300	8·06	30		22	2,624,100	160,000	6·13
		23	2,203,300	186,100	8·46			23	3,312,200	226,100	6·83
		24	2,792,900	206,200	7·40			24	2,416,900	190,000	7·85
		25	3,241,700	262,500	8·11			25	2,464,600	258,200	10·50
		26	...	...	...			26	2,659,700	207,200	7·79
22		27	2,145,900	176,900	8·23			27	3,450,300	172,100	4·99
	ES	28	3,999,400	308,200	7·70			28	...	...	...
		29	2,881,900	176,200	6·12	31		29	2,593,700	195,900	7·57
	Bank Disct. 5 per cent.	30	2,088,700	149,700	7·16		FS	30	3,200,300	266,400	8·33
	FS	31	4,117,200	233,200	5·66			31	3,521,200	227,500	6·46
			80,587,600	5,615,000					83,865,200	6,284,800	
		June						Aug.			
22		1	3,523,300	171,000	4·86	31	Bank Disct. 6 per cent.	1	2,675,500	176,100	6·58
		2	...	...	...						
23		3	2,327,300	223,800	9·60			2	2,939,500	227,300	7·73
	IB	4	4,518,300	345,500	7·65		IB	3	4,554,500	291,000	6·41
		5	2,471,100	134,100	5·42			4	...	...	...
		6	1,760,200	151,800	8·63	32		5	3,214,100	186,500	5·82
		7	2,596,500	201,900	7·77			6	3,300,100	187,700	5·69
		8	3,612,600	232,000	6·43			7	2,799,400	260,100	9·29
		9	...	...	...			8	2,246,100	152,100	6·76
24		10	2,638,100	220,800	8·36			9	3,140,800	143,200	4·56
		11	2,847,200	313,000	10·98			10	3,856,400	235,400	6·10
		12	2,221,700	148,100	6·67			11	...	...	...
		13	1,972,300	241,200	12·25	33		12	2,965,200	156,200	5·27
	FS	14	3,406,700	256,200	7·51			13	3,560,400	275,700	7·75
		15	3,180,200	185,700	5·84			14	2,733,100	218,100	7·99
		16	...	...	...		FS	15	3,644,000	284,800	7·82
25		17	2,376,600	196,500	8·26			16	2,887,400	331,000	8·00
		18	2,714,400	206,700	7·63			17	3,663,100	256,000	7·00
		19	2,398,100	197,100	8·21			18	...	...	...
	Bank Disct. $5\frac{1}{2}$ per cent.	20	1,773,200	193,700	10·94	34		19	2,531,100	173,000	6·84
		21	2,467,800	133,000	5·39			20	3,050,300	182,400	5·98
		22	3,313,700	138,500	4·18			21	2,658,400	196,600	7·40
		23	...	...	...			22	2,352,500	230,600	9·81
26		24	2,501,700	239,200	9·57			23	2,914,600	226,800	7·80
		25	2,748,300	193,200	7·02			24	3,489,000	256,700	7·36
		26	1,529,700	140,000	9·15	35		25	...	...	...
		27	1,651,900	154,700	9·38			26	3,075,700	282,900	9·19
	FS	28	3,819,400	244,500	6·40			27	3,157,100	376,400	11·91
		29	3,043,100	197,300	6·50			28	2,638,200	180,100	6·82
		30	...	...	...		ES	29	5,267,800	375,900	7·13
							FS	30	4,587,400	208,200	4·54
								31	3,708,800	194,000	5·32
			67,413,900	5,060,000					87,610,500	6,164,900	

Aggregate Demands made through the Clearing House upon the Bankers who use the Clearing House on each day in the Year 1839, *&c.*—Continued.

No. of the Week.		Date.	Aggregate Demands.	Bank Notes.	Bank Notes Per Cent.	No. of the Week		Date.	Aggregate Demands.	Bank Notes.	Bank Notes Per Cent.
		Sept.	£	£				Nov.	£	£	
		1	...	...		44		1	2,311,100	246,400	0·66
36		2	2,544,000	159,900	6·30			2	3,786,100	208,400	5·50
		3	3,262,700	184,400	5·66			3	..	...	...
	IB	4	3,820,100	295,300	7·73	45	IB	4	3,457,600	194,900	5·65
		5	2,027,700	225,200	11·09			5	3,625,400	249,600	6 90
		6	2,833,800	178,900	6·32			6	2,739,200	198,400	7·24
		7	3,145,100	193,100	6·13			7	2,677,200	141,400	5·28
		8	...	...	...			8	2,994,700	193,200	6·47
37		9	2,342,300	158,200	6·76			9	3,456,600	201,000	5·81
		10	2,854,200	158,100	5·55			10	...	...	...
		11	2,466,600	188,900	7·65	46		11	2,922,200	158,300	5·42
		12	2,196,800	146,800	6·67			12	3,669,600	249,100	6·79
		13	3,075,400	209,900	6·82			13	3,113,600	156,900	5·05
		14	3,480,500	213,200	6·13			14	2,367,900	146,100	6·17
		15	...	...	...		FS	15	4,883,200	204,600	4·19
38	FS	16	4,758,700	249,000	5·23			16	3,362,500	183,500	5·46
		17	2,968,500	159,600	5·38			17	...	...	...
		18	2,145,700	180,400	8·39	47		18	2,781,100	130,900	4·71
		19	1,815,800	156,900	8·62			19	3,244,000	201,200	6·21
		20	2,577,400	163,300	6·33			20	2,484,200	110,300	4·45
		21	3,847,700	282,600	7·34			21	1,932,900	126,700	6·56
		22	...	...	...			22	2,685,400	175,600	6·53
39		23	3,175,200	191,500	6·02			23	3,281,000	170,100	5·19
		24	2,967,500	252,400	8·74			24	...	..	...
		25	2,437,700	245,700	10·07	48		25	2,300,200	175,200	7·62
		26	2,125,000	150,600	7·07			26	3,024,700	192,200	6 37
		27	2,812,300	312,300	11·11		ES	27	4,253,000	178,500	4·20
		28	3,469,500	233,700	6·74			28	2,496,200	161,900	6·48
		29	...	...	...		FS	29	4,393,400	266,800	6·08
40	FS	30	5,087,500	232,900	4·58			30	3,486,200	171,900	4·93
			74,237,700	5,129,800					81,729,200	4,793,100	
		Oct.						Dec.			
40		1	3,200,900	276,200	8·63	49		1	...	...	...
		2	2,428,600	117,900	4·86			2	2,373,900	235,000	9·92
		3	2,255,500	160,900	7·12			3	4,089,800	228,500	5·59
	IB	4	4,090,600	255,600	6·25		IB	4	3,804,000	279,500	7·36
		5	3,413,700	171,300	5·03			5	2,623,000	197,500	7·54
		6	...	...	...			6	3,159,000	212,400	6·72
41		7	2,595,000	162,500	6·25			7	3,723,600	171,000	4·61
		8	3,284,700	262,800	8·01			8	...	...	...
		9	2,244,200	150,500	6·72	50		9	2,506,600	190,400	7 59
		10	2,022,200	181,500	8·99			10	2,694,700	191,500	7·12
		11	3,054,900	272,800	8·95			11	2,137,600	179,000	8·36
		12	3,773,300	199,400	5·29			12	2,254,300	162,700	7·23
		13	...	...	...			13	2,647,300	134,600	5·08
42		14	2,961,400	280,200	9·47			14	3,155,300	207,300	6·56
	ES	15	6,209,900	271,300	4·37			15	...	...	...
	FS	16	4,730,000	232,000	4·91	51	FS	16	3,965,800	241,900	6·10
		17	3,092,100	194,200	6·28			17	3,140,000	146,400	4·66
		18	3,807,000	192,200	5·04			18	2,032,900	144,100	7·06
		19	3,646,400	246,700	6·76			19	2,240,300	138,800	6·20
		20	...	...	...			20	2,619,700	201,400	7·69
43		21	2,764,300	183,700	6·66			21	3,027,600	133,300	4·40
		22	3,402,000	306,900	9·03			22	...	...	...
		23	3,233,300	206,300	6·39	52		23	2,378,200	149,300	6·27
		24	2,161,700	177,300	8·21			24	2,861,500	197,900	6·92
		25	2,983,300	173,100	5·81			25	...	...	...
		26	3,423,800	234,800	6 87			26	1,980,000	148,900	7·52
		27	...	...	...			27	2,275,200	223,400	9 80
44		28	2,484,900	168,500	6·80			28	2,842,100	187,100	6·59
		29	3,147,300	242,700	7·71			29	...	...	...
		30	2,534,200	166,400	6·58	53		30	2,659,200	255,500	9·61
	FS	31	4,533,000	219,100	4·84		FS	31	3,642,200	197,600	5·43
			87,478,200	5,706,800					70,833,800	4,755,000	

Aggregate Demands made through the Clearing House upon the Bankers who use the Clearing House on each day in the Year 1839, *&c.*—Continued.

Date.	Aggregate Demands.	Bank Notes.	Per Cent.
1839.	£	£	£
January	82,762,400	6,348,500	7·672
February	76,164,700	4,960,200	6·513
March	75,879,200	5,621,500	7·408
April	85,839,200	5,836,000	6·800
May	80,587,600	5,615,000	6·882
June	67,413,900	5,060,000	7·506
July	83,865,200	6,284,800	7·494
August	87,610,500	6,164,900	7·037
September	74,237,700	5,129,800	6·910
October	87,478,200	5,706,800	6·524
November	81,729,200	4,793,100	5·866
December	70,833,800	4,755,000	6·713
	954,401,600	66,275,600	6·944

List of Bankers connected with the Clearing House.

Barclay, Bevan, Tritton, and Co.
Barnard, Dimsdale, Barnard, & Dimsdale
Barnetts, Hoare, and Co.
Bosanquet and Co.
Brown, Janson, and Co.
Curries
Denison, Heywood, Kennard, and Co.
Dorrien, Magens, Dorrien, Mello, and Co.
Fullers and Co.
Glyn (Sir R. Carr, Bart.,) Halifax, Mills, and Co.
Hanbury, Taylor, and Lloyds
Hankeys and Co.
Jones, Lloyd, and Co.
Ladbrokes, Kingscote, and Gillman
Lubbock (Sir John W., Bart.), Forster, Clarke, and Co.
Masterman, Peters, Mildred, Masterman, and Co.
Prescott, Grote, Ames, Baillie, and Grote
Price (Sir Charles, Bart.), Marryatt, Coleman, and Price
Robarts, Curtis, and Co.
Rogers, Olding, Sharpe, Boycott, and Co.
Smith, Payne, and Smiths
Spooner, Attwoods, and Co.
Stevenson, Salt, and Sons
Stone, Martin, and Stones
Veres, Sapte, Banbury, Muspratt, and Co.
Weston and Young
Whitmore, Wells, and Whitmore
Williams, Deacon, Labouchere, and Co.
Willis, Percivall, and Co.

THE MARRIAGES, BIRTHS, AND DEATHS,

REGISTERED IN THE DIVISIONS, COUNTIES, AND DISTRICTS OF ENGLAND.

The Marriages for the Quarter ended March, 1856, *and the Births and Deaths for the Quarter ended June*, 1856,

AS PUBLISHED BY AUTHORITY OF THE REGISTRAR-GENERAL.

THIS return comprises the births and deaths registered by 2,196 registrars in all the districts of England during the spring quarter that ended on June 30th, 1856; and the marriages in 12,180 churches or chapels, about 3,754 registered places of worship unconnected with the Established Church, and 628 superintendent registrars' offices, in the quarter that ended on March 31st, 1856.

The marriage rate, which was low, is now slightly above the average rate; the birth rate is high; and the death rate is low; so that the state of the population, in the light of these returns, is favourable.

MARRIAGES.—66,776 persons were married in the three months of January, February, and March. The annual rate in the quarter was 707 marriages to every 100,000 of the population; while the rate in the winter of 1855 was 631 (or less by one-tenth), and the average rate of the preceding winter quarters was 704. The marriages (33,388) were more by 4,257 than the marriages (29,131) in the winter quarter of 1855; and the increase is a sure indication of the prosperity of the country. The increase of marriages is observed in every division. The excess in the numbers in Portsmouth, Plymouth, and Hull is probably due to the return of our gallant seamen from the Black Sea and the Baltic.

BIRTHS.—173,204 boys and girls were born alive and registered in the spring quarter that ended on the last day of June; giving an increase of 7,954 children on the numbers of the corresponding quarter of 1855. It is the spring quarter in which the greatest number of births generally occurs; and this number is the

Marriages, Births, and Deaths, returned in the Years 1844-56 *and in the Quarters of those Years.*

YEARS.....	1844	1845	1846	1847	1848	1849	1850	1851	1852	1853	1854	1855	1856
Marriages	132249	143748	145664	135845	138230	141883	152744	154206	158782	164520	159849	151774	...
Births.....	540763	543521	572625	539965	563059	578159	593422	615865	624012	612391	634506	635123	...
Deaths	356933	349366	390315	423304	399833	440839	368995	395396	407135	421097	438239	426242	...
	MARRIAGES.												
Quarters ended the last day of													
March.....	26387	29551	31417	27480	28398	28429	30567	32724	32977	35149	33144	29131	33388
June	34268	35300	37111	35197	34721	35844	39204	38635	40092	40446	40389	38454	...
September	31675	35003	35070	32439	32995	33874	37636	37316	38400	39899	38150	37151	...
December	39919	43889	42066	40729	42116	43736	45337	45531	47313	49026	47666	47038	...
	BIRTHS.												
March.....	143578	143080	145108	146453	139736	153772	144551	157286	161803	161729	160892	166136	169252
June	136941	136853	149450	139072	149760	153693	155865	159073	159031	158697	172420	165250	173204
September	130078	132369	138718	127173	140359	135223	146911	150594	151222	147602	154735	154834	...
December	130166	131219	139349	127267	133204	135471	146095	148912	151956	144363	146459	148853	...
	DEATHS.												
March.....	101024	104664	89484	119672	120032	105870	98430	105359	106358	118119	111970	134605	103208
June	85337	89149	90230	106718	99727	102153	92871	99458	100625	107647	102666	106584	100310
September	79708	74872	101664	93435	87638	135227	85849	91499	100382	92201	113939	87934	...
December	90864	80681	108937	103479	92436	97589	91845	99080	99770	103130	109664	97119	...

highest that has ever been returned in England. The number of registered births rose from 136,941 in the spring quarter of 1844, to 173,204 in the last spring quarter.

Increase of Population.—As the number of births was 173,204, and the number of deaths 100,310, the natural increase of the population of England was 72,894 in the three months of April, May, and June; so 1,903 lives were added, 1,102 were taken away, daily; leaving 801 as the daily increase. But in the same three months 60,379 emigrants left the ports of the United Kingdom at which Government agents are stationed; and of that number about 21,304 were of English origin. England, exclusive of Scotland and Ireland, sent about 234 emigrants daily over the seas, to Australia, to the United States, and to the North American Colonies. Of the immigrants who enter England, from Scotland, Ireland, and other parts, no statistical records are kept.

The emigration from the ports of the United Kingdom is less by nearly 6,000 than the emigration (66,111) in the spring quarter of 1855, and is less than half the average emigration (113,141) of the corresponding quarters of the eight years 1847-54.*

England:†—*Annual Rate per Cent. of Marriage, Birth, and Death, during the Years* 1846-56, *and the Quarters of those Years.*

Estimated Population of England in thousands in the middle of each Year.....	16925	17132	17340	17552	17766	17983	18206	18403	18612	18786	...	19043
Years	1846	1847	1848	1849	1850	1851	1852	1853	1854	1855	Mean, 1846–55	1856
Marriages.....	·861	·793	·797	·808	·860	·858	·872	·894	·856	·808	·841	...
Births	3·383	3·152	3·247	3·294	3·340	3·425	3·428	3·328	3·408	3·381	3·339	...
Deaths	2·306	2·471	2·306	2·512	2·077	2·199	2·236	2·288	2·354	2·269	2·302	...
	Marriages.											
Quarters ended the last day of												
March	·757	·655	·661	·661	·702	·742	·730	·778	·726	·631	·704	·707
June	·882	·826	·805	·822	·888	·864	·885	·883	·872	·822	·855	...
September	·822	·751	·755	·766	·840	·822	·836	·859	·812	·783	·805	...
December.....	·983	·940	·961	·986	1·010	1·000	1·027	1·053	1·013	·989	·996	...
	Births.											
March	3·498	3·488	3·252	3·575	3·321	3·567	3·582	3·578	3·523	3·602	3·499	3·585
June	3·551	3·265	3·474	3·523	3·530	3·557	3·509	3·464	3·722	3·534	3·513	3·655
September	3·251	2·945	3·211	3·056	3·281	3·317	3·291	3·177	3·294	3·265	3·209	...
December.....	3·256	2·938	3·038	3·053	3·253	3·270	3·298	3·100	3·111	3·128	3·145	...
	Deaths.											
March	2·157	2·850	2·794	2·462	2·261	2·388	2·354	2·613	2·452	2·918	2·525	2·186
June	2·144	2·506	2·313	2·341	2·107	2·224	2·221	2·355	2·216	2·279	2·271	2·117
September	2·382	2·163	2·005	3·057	1·917	2·015	2·185	1·985	2·425	1·854	2·199	...
December.....	2·545	2·389	2·108	2·199	2·045	2·176	2·165	2·214	2·330	2·041	2·221	...

† The table may be read thus, without reference to the decimal points:—In the year 1848, to 100,000 of the population of England there were 797 marriages, 3,247 births, and 2,306 deaths registered. The annual rates of marriage in each of the four quarters were ·661, ·805, ·755, and ·961 per cent.; the rates of death 2·794, 2·313, 2·005, and 2·108 per cent. In reading the population on the first line add three ciphers (000). The three months January, February, March, contain 90, in leap year 91 days; the three months April, May, June, 91 days; each of the last two quarters of the year 92 days. For this inequality a correction has been made in the calculation.

* From a Return with which the Registrar-General has been favoured by the Emigration Commissioners.

THE PRICE OF PROVISIONS, AND THE WEATHER.—The prices of some of the principal articles of food are shown in the annexed table, with a view of determining the effect of their variations on the births, deaths, and marriages.

During the last three months, wheat was sold on an average at the rate of 68*s.* 8*d.* a quarter; York regent potatoes at 80*s.* a ton, at the waterside market, Southwark; beef at 5¼*d.* a pound, mutton at 5⅞*d.* a pound, in the Leadenhall and Newgate markets. The price of wheat in the corresponding three months of 1854, 1855, and 1856, declined from 78*s.* 4*d.* to 68*s.* 8*d.*, or nearly 10*s.* a quarter; potatoes fell from 155*s.* to 80*s.* a ton; beef fell only from 5⅜*d.* to 5⅝*d.* per pound;

The Average Prices of Consols, of Wheat, Meat, and Potatoes, also the Average Quantity of Wheat sold and imported Weekly, in each of the nine Quarters ended June 30th, 1856.

Quarters ended	Average Price of Consols (for Money.)	Average Price of Wheat per Quarter in England and Wales.	Wheat sold in the 290 Cities and Towns in England and Wales making Returns.	Wheat and Wheat Flour entered for Home Consumption at Chief Ports of Great Britain.	Average Prices of Meat per lb. at Leadenhall and Newgate Markets (by the Carcase).		Average Prices of Potatoes (York Regents) per Ton at Waterside Market, Southwark.
			Average Number of Quarters weekly.		Beef.	Mutton.	
1854	£						
June 30.	88⅝	78*s.* 4*d.*	55,842	103,331	4½*d.*—6¼*d.* Mean 5⅜*d.*	4¾*d.*—6¾*d.* Mean 5¾*d.*	137*s.*—172*s.* Mean 155*s.*
Sept. 30.	93⅞	63*s.* 10*d.*	56,389	48,135	4¾*d.*—6¾*d.* Mean 5¾*d.*	5*d.*—7*d.* Mean 6*d.*	75*s.*—85*s.* Mean 80*s.*
Dec. 31.	93⅝	68*s.* 0*d.*	128,783	19,513	4½*d.*—6¾*d.* Mean 5⅝*d.*	5*d.*—7*d.* Mean 6*d.*	95*s.*—105*s.* Mean 100*s.*
1855							
Mar. 31.	91⅞	69*s.* 11*d.*	88,000	33,821	4¾*d.*—6½*d.* Mean 5⅝*d.*	4¾*d.*—6½*d.* Mean 5⅝*d.*	105*s.*—120*s.* Mean 112*s.* 6*d.*
June 30.	90⅝	73*s.* 4*d.*	94,791	57,068	4½*d.*—6½*d.* Mean 5½*d.*	4¾*d.*—6¾*d.* Mean 5¾*d.*	110*s.*—130*s.* Mean 120*s.*
Sept. 30.	90⅝	76*s.* 1*d.*	94,545	51,511	5*d.*—6¾*d.* Mean 5⅞*d.*	5*d.*—7*d.* Mean 6*d.*	69*s.*—79*s.* Mean 74*s.*
Dec. 31.	88¼	79*s.* 4*d.*	126,893	42,358	4¾*d.*—6¾*d.* Mean 5¾*d.*	4¾*d.*—6¾*d.* Mean 5¾*d.*	90*s.*—100*s.* Mean 95*s.*
1856							
Mar. 31.	90⅝	72*s.* 4*d.*	92,152	48,018	4¼*d.*—6¼*d.* Mean 5¼*d.*	4¼*d.*—6½*d.* Mean 5⅜*d.*	78*s.*—93*s.* Mean 86*s.*
June 30.	93⅜	68*s.* 8*d.*	104,952	63,093	4¼*d.*—6¼*d.* Mean 5¼*d.*	5*d.*—6¾*d.* Mean 5⅞*d.*	70*s.*—90*s.* Mean 80*s.*
Col.	1	2	3	4	5	6	7

Note.—The total number of quarters of wheat sold in England and Wales for the 13 weeks ended June 30th, 1854, 725,946; for the 13 weeks ended September 30th, 1854, 733,059; for the 13 weeks ended December 31st, 1854, 1,674,173; for the 13 weeks ended March 31st, 1855, 1,143,999; for the 13 weeks ended June 30th, 1855, 1,232,284; for the 13 weeks ended September 30th, 1855, 1,229,082; for the 13 weeks ended December 31st, 1855, 1,649,610; for the 13 weeks ended March 31st, 1856, 1,197,970; and for the 13 weeks ended June 30th, 1856, 1,364,370. The total number of quarters entered for Home Consumption was, respectively, 1,343,305; 625,755; 253,669; 439,676; 741,890; 669,639; 550,652; 624,233; and 820,206.

mutton, on the other hand, rose from $5\frac{6}{8}d.$ to $5\frac{7}{8}d.$ per pound. Upon the whole, the prices of articles of most extensive consumption, as food, declined.

The value of the public securities rose.

The weather during the last three months is fully described in Mr. Glaisher's Meteorological Report. The mean temperature at Greenwich was 52°·3, the fall of rain was 7·4. (See Mr. Glaisher's Report, p. 296.)

State of the Public Health.—The deaths in the three spring months were 100,310; and the annual mortality was at the rate of 2·117 per cent. or nearly 21 in 1000; the average annual rate of the season being nearly 23 in 1000. The mortality has been, during the whole of the half year past, much below the average rate.

The mortality in the spring quarter among the people living in the districts and the sub-districts comprising the chief towns of England was at the annual rate of 23·85 (nearly 24) per 1000; the mortality of the rest of the people in the small towns and in the country parishes was at the annual rate of 18·78 (nearly 19) per 1000. The rate of mortality is in both classes of districts below the average; but the reduction of the rate is less considerable in the town than in the country populations.

The changes in the diseases and the low mortality that has reigned in London have been noticed in the Weekly Tables. The salutary effects of the improved

Deaths in the Spring Quarters, 1846-56.

	1846	1847	1848	1849	1850	1851	1852	1853	1854	1855	Total 1846–55 (10 Yrs.)	1856
In 125 Districts and 23 Sub-districts, comprising the chief towns	45711	53155	48887	50469	45039	50501	50588	54131	53797	53653	505931	52037
In the remaining Districts and Sub-Districts of England and Wales, comprising chiefly small towns and country parishes ...	44519	53563	50840	51684	47832	48957	50037	53516	48869	52931	502748	48273
All England	90230	106718	99727	102153	92871	99458	100625	107647	102666	106584	1008679	100310

Area, Population, Deaths, and Mortality per Cent. in the Spring Quarters, 1846-56.

	Area in Statute Acres.	Population Enumerated.		Deaths in 10 Spring Quarters, 1846–55.	Average Annual Rate of Mortality per Cent. of 10 Spring Quarters, 1846–55.	Annual Rate of Mortality per Cent. in the Spring Quarter 1856.
		June 6–7th, 1841.	March 31st, 1851.			
In 125 Districts, and 23 Sub-Districts, comprising the chief towns	2,149,800	6,838,069	8,247,017	505,931	2·466	2·385
In the remaining Districts and Sub-districts of England and Wales, comprising chiefly small towns and country parishes	35,175,115	9,076,079	9,680,592	502,748	2·081	1·878
All England	37,324,915	15,914,148	17,927,609	1,008,679	2·271	2·117

water supply, and of other sanatory measures, in Bermondsey, are pointed out by one of the registrars; as similar improvements in Lambeth and other districts are referrable to the same causes, the whole of the results can be collected and discussed most conveniently together when a greater number of facts has accumulated.

The deaths (8158) in the South-Eastern Counties are below the average number; and nearly a thousand less than the deaths in the spring quarter of the previous year. In Kent the deaths slightly exceeded the average; in Surrey, Sussex, Hants, and Berks, the decrease was well marked. Scarlatina and measles prevailed in some districts of Kent; at Faversham malignant scarlatina prevailed through the whole quarter, and the deaths were nearly doubled. The registrar of Newport in the Isle of Wight states, that he has registered four deaths from small-pox in the Parkhurst barracks. In the Isle of Wight generally, in the New Forest, and in some other districts of the division, the mortality has been at as low a rate as 16 in 1,000.

The South Midland Counties were generally in a healthy state; the deaths in the quarter were 6,270. In Oxfordshire, Northamptonshire, and Huntingdonshire, the mortality was nearly at the average rate; in Buckinghamshire and in Cambridgeshire the rate of mortality was much below the average. Small-pox was very prevalent in Northampton; and the deaths from all causes were 295; so the mortality was at the annual rate of nearly 35 in 1,000. At Cambridge the deaths during the last three spring quarters were 155, 150, and 101. The registrar of St. Andrew's, Cambridge, says:—

"The decrease in the deaths compared with those of the same quarter in 1855 speaks well for the healthy condition of this district, and may in some measure be accounted for by the introduction of a large and constant supply of water last autumn, in pipes from a distance of two or three miles, which will not only be the means of great comfort and convenience to the inhabitants, but will also materially assist in cleansing the town. Scarlatina appears to be the most prominent, if not the only, disease among children."

The beneficial effects of a constant supply of pure water on the health of the town populations become every day more apparent.

The deaths in the Eastern Counties were 5,758, while the numbers in the previous spring quarter were 6,194. The mortality was low in Norwich. Scarlatina in a severe form prevailed in Epping, Great Warley, Bradwell, Hempstead (Parish), South Walsham and Hillington. The fishermen in King's Lynn North refuse generally to have their children vaccinated; and ten died of small-pox.

The South-Western Counties lost 8,516 of the inhabitants by death; but the mortality was low in every county, and the deaths were 1,177 less than the deaths in the spring quarter of 1855. At Trowbridge in Wilts it is gratifying to find that many families have removed with the best effect from unhealthy yards to healthy cottages, with small gardens attached, in the outskirts of the town. The improvement of the houses is sure to be followed by the improvement of the inhabitants. The pernicious effects of the night soil, which is still left under the houses in our towns, have been fatally proved in Poole; where three men died from descending into the vaults. The registrar remarks:—"If the machine with hose had been used, this sad result, which has rendered seven children fatherless, and three wives widows, could not have occurred."

In proceeding northwards, the diminution in the mortality of the divisions is less considerable. In Staffordshire the deaths (4081) are rather more numerous than the deaths in the previous spring quarter; but in the other counties of the West Midland Division the deaths exhibit a decrease. 1133 deaths were recorded in the Birmingham district. Small-pox, scarlatina, and measles prevailed in some districts.

In the North Midland Counties 6,290 deaths were registered. In Lincolnshire

a remarkable decrease is observed in the deaths, which were 2,067, 2,251, and 1,714 in the three last spring quarters.

The deaths in the North Western Division were 16,088; namely, 2,318 in Cheshire, and 13,770 in Lancashire. The numbers are a little below the average. Liverpool and West Derby exhibit a gratifying decrease in the mortality; the deaths in the two districts were 2,799 to a population of 411,515 in 1851. The registrar of the West Derby sub-district makes the following remarks :—

"My district during the whole of the quarter has been in a more healthy state than at any former period; so much so, that during the week ending Saturday the 24th May there were only three deaths in the whole sub-district, which at the census of 1851 contained 33,013 inhabitants, and there will be an increase on that number of at least 5,000 since that time, The township of West Derby has always been noted as the most healthy locality in the vicinity of Liverpool, and this usually favourable state of the district is further improved by the excellent system of draining, sewering, and cleansing the streets that has been adopted. The births have for some time past been double the number of deaths, owing to the healthy state of the district and the increased population."

Sanatory measures in Liverpool will we may hope henceforward reduce the high mortality which has reigned there, and to which the attention of the authorities was first called in these reports.

10,689 deaths were registered in Yorkshire; and of that number 1,358 occurred in Bradford, to a population of 181,964 in 1851; 1,242 were registered in Leeds and Hunslet; 695 were registered in Sheffield.

The 5,834 deaths in the Northern Counties slightly exceed in number the deaths in either of the two previous spring quarters. Small-pox and scarlatina have prevailed. Vaccination is evidently neglected among the colliers. The mortality increased in Durham and in Northumberland; decreased in Cumberland and in Westmorland.

In Wales and Monmouthshire 6,781 deaths were registered; the deaths in the previous spring quarter were 7,392. Small-pox and scarlatina have prevailed epidemically in some districts.

At this season of the year, when many people are travelling on the continent, as well as in England, it may be useful to state that it is now well established by extensive observation, that England is the healthiest country in Europe. France stands next to England in salubrity. In the continental cities the annual rate of mortality is seldom less than 30 in 1,000; and the rate frequently rises to 40 in 1,000. In London the rate of mortality is 25 in 1,000.

On an average of ten years (1841-50) the mortality was at the annual rate per 1,000 of 15 in three English districts, 16 in fourteen districts, 17 in forty-seven districts, 18 in eighty-seven districts. These facts prove that the climate of England is eminently salubrious; and it has not yet been shown that the climate of any part of the continent is equally or more salubrious than this island, crowned with hills of moderate elevation, sloping towards the east and the south; bathed by the showers of the Atlantic; drained naturally by rivers running short courses to the sea; cultivated more extensively than other lands; and producing those unequalled breeds of sheep, cattle, and horses, which flourish only in healthy places.

The healthiest parts of England are not yet places of general resort; but the annual mortality in the various districts, comprising watering places, seldom exceeds 21 in 1,000 of the population; and is probably lower in those regions of the districts to which visitors resort. The annexed Table shows the mortality of some of the principal English watering places. It will be observed, on inspecting the last column, and comparing the deaths with the population, that Hastings, Brighton, the Isle of Wight, Worthing, Mutford (including Lowestoft), Newton

Abbot, Barnstaple (including Ilfracombe), Bath, and Cheltenham, have experienced low rates of mortality during the spring quarter. And it should be always borne in mind, in selecting places of resort, that through the peculiar nature of zymotic diseases, places usually healthy are periodically visited by epidemics, which can only be avoided by consulting recent returns, or by actual inquiries on the spot. The cleansing and the sewerage of all watering places require improvement, as their arrangements were made when sanatory science was at a low ebb.

Mortality in the Districts containing some of the principal English Watering Places.

Districts.	Deaths annually to 1,000 persons living during the 10 years 1841 to 1850.	Deaths registered in the 3 months ended 30th June, 1856.	Districts.	Deaths annually to 1,000 persons living during the 10 years 1841 to 1850	Deaths registered in the 3 months ended 30th June, 1856.
Tunbridge (including Tunbridge Wells)	20	144	Bath	24	318
Thanet (including Ramsgate and Margate)	19	135	Clifton (including part of Bristol City and Bristol Workhouse)	23	437
Dover	21	135	Cheltenham	20	178
Hastings	18	103	Upton-on-Severn (including Malvern)	18	85
Eastbourne	15	40			
Brighton	21	304	Warwick (including Leamington)	20	205
Worthing (including Littlehampton and Arundel)	17	74	Ashborne, Bakewell, and Chapel-en-le-Frith (including Buxton and Matlock)	20	321
Isle of Wight (including Ryde, Newport, and Cowes	17	209			
			Scarborough	21	109
Mutford (including Lowestoft)	17	80	Knaresborough (including Harrogate)	20	180*
Yarmouth	23	126	Whitby	21	113
Newton Abbot (including Dawlish, Torquay, and East and West Teignmouth)	19	238	Kendal	20	168
			Aberystwyth	18	131
			Bangor	21	204
Barnstaple (including Ilfracombe)	17	128	Anglesey	17	208

* This number includes the deaths in Great Ouseburn and Wetherby, which formed part of the Knaresborough district during the period (1841-50), alluded to in the previous column.

Note.—The numbers of births and deaths in this return are furnished by the Registrars at the end of the quarter, and have not yet been subjected to revision at the General Register Office; they will therefore be found to differ, in some instances, from the more correct numbers to be published hereafter in the Annual Report of the Registrar General.

Marriages Registered in the Quarters ended 31st March, 1854-56; *Births and Deaths Registered in the Quarters ended 30th June*, 1854-56, *in the Divisions of England.*

DIVISIONS.	Area in Statute Acres.	Population, 1851.	Marriages			Births			Deaths		
			Registered in the Quarter ended the last Day of								
			March			June			June		
			1854.	1855.	1856.	1854.	1855.	1856.	1854.	1855.	1856.
England	37,324,915	17,927,609	33,144	29,131	33,388	172,420	165,250	173,204	102,666	106,584	100,310
Divisions.											
I. London	78,029	2,362,236	5,373	4,723	5,526	22,109	21,446	22,245	15,114	14,984	14,098
II. South Eastern Counties	4,065,105	1,628,386	2,316	2,176	2,588	13,730	12,761	13,887	7,984	9,133	8,158
III. South Midland Counties	3,201,290	1,234,332	1,544	1,346	1,654	10,925	10,202	10,835	6,236	6,883	6,270
IV. Eastern Counties	3,214,099	1,113,982	1,463	1,362	1,582	9,676	9,107	9,723	5,364	6,194	5,758
V. South Western Counties	4,994,490	1,803,291	3,026	2,746	3,130	15,298	14,324	15,018	8,616	9,693	8,516
VI. West Midland Counties	3,865,332	2,136,573	4,115	3,472	4,042	21,884	21,329	21,952	12,994	12,713	11,828
VII. North Midland Counties	3,540,797	1,215,501	2,012	1,747	1,932	11,158	10,694	11,514	6,899	6,624	6,290
VIII. North Western Counties	2,000,227	2,488,438	5,947	4,784	5,285	27,557	26,761	27,450	16,273	16,958	16,088
IX. Yorkshire	3,654,636	1,789,047	3,612	3,170	3,633	19,015	18,036	18,796	10,905	10,414	10,689
X. Northern Counties	3,492,322	969,126	1,826	1,741	1,871	9,824	9,771	10,313	5,316	5,596	5,834
XI. Monmouthshire and Wales	5,218,588	1,186,697	1,910	1,864	2,145	11,244	10,819	11,471	6,965	7,392	6,781

On the Meteorology of England, during the Quarter ended June 30th, 1856. By James Glaisher, Esq., F.R.S., *Sec. of the British Meteorological Society.*

The high day temperature in April was 0°·4 in excess; in May was the very large amount of 5¼° in defect; and in June was about its average value.

The low night temperature in April was 0°·6 in defect; in May was 1¾° in defect; and in June was about its average value.

The mean temperature in April was slightly in excess, much in defect in May, and differed but little from its average in June. The periods and average daily amount of excess were from April 1st to 15th, 3½°; for the first 13 days of June, 1°; and from June 25th to 30th, 4°. The periods and average daily amount of defect were from April 16th to 30th, 2½°; from May 1st to 9th, 9½°; from 10th to 31st, 1¼°; and from June 14th to 24th, 4°. The temperature upon the quarter was in defect to the amount of 1¼°, as compared with the corresponding quarter of the preceding 15 years.

The atmospheric pressure was greater in May than in April at all stations; the amount at extreme northern stations was 0·1 inch, which decreased proceeding northward to 0·03 inches, or 0·04 inches in latitude 53°, and increased to 0·1 inch at extreme northern stations. In June at southern stations the excess over May was 0·26 inches, and this quantity gradually decreased going northwards till at extreme northern stations, the pressure was less in June than in May.

The pressure of the atmosphere was in defect during the months of April and May, and in excess in June. Upon the whole quarter it was slightly in defect.

The water mingled with the air was in defect in the first two months, and slightly in excess in June.

The degree of humidity was below its average in April, of its average value in May, and in excess in June. Upon the quarter it was of its average value.

The daily ranges of temperature were slightly in excess in April; in defect in May; and of their average values in June.

Rain was somewhat in excess in April and May, particularly in the latter month, and slightly in defect in June.

The general direction of the wind for the quarter was west, and the least prevalent was east at all places.

The mean temperature of the air at Greenwich for the quarter ending May, constituting the three spring months, was 45°·0, being −1°·5 below the average of 85 years. (See table, next page.)

Thunderstorms occurred, or thunder was heard and lightning seen, on the 4th April at Nottingham and York; on the 13th at Scarborough; on the 14th at Helston and Maidstone; and on the 30th at Patrixbourn. On the 7th of May at Maidstone; on the 12th at Lambeth; on the 13th at Leeds and York; on the 14th at York, Allenheads, North Shields, and Durham; on the 17th at Lewisham, London, Battersea, and Lambeth; on the 18th at London and York; on the 19th at North Shields; on the 22nd at Berkhampstead, Knebworth, Cardington, Worcester and Leeds; on the 23rd at Worcester, Nottingham, Bowdon, Liverpool, and Stonyhurst; 24th at Eign and Holkham; on the 25th at Worcester; on the 26th at Wakefield, Leeds, and York; on the 27th at Lambeth, Holkham, Liverpool, Leeds, and York; on the 28th at Paddington, Battersea, Rose Hill, Oxford, and Worcester; and on the 29th at Newport. On the 13th of June at Lambeth; on the 14th at Hartwell and Belvoir; on the 19th at Lambeth, Rose Hill, Bicester, Berkhampstead, Oxford, Hartwell, Knebworth, Royston, Bedford, Worcester, and Hawarden; and on the 20th at Maidstone, Lewisham, London, Battersea, Hartwell, Knebworth, and Bedford.

Thunder was heard, but lightning was not seen, on the 4th April at Belvoir and Wakefield; on the 6th at Teignmouth and Rose Hill; on the 7th at Patrixbourn; on the 9th at Teignmouth and Hastings; on the 13th at Knebworth, Worcester, Holkham, Liverpool, and Wakefield; on the 14th at Lampeter; on the 25th at Hastings, Belvoir, and Nottingham; on the 26th at Knebworth; on the 28th at Belvoir, Nottingham, and Wakefield; on the 29th at Belvoir; and on the 30th at Knebworth. On the 11th of May at Holkham; on the 13th at Wakefield; on

the 14th at Grantham, Nottingham, and Wakefield; on the 15th at Nottingham; on the 17th at Bicester; on the 21st at Ryde; on the 22d at Guernsey, Hartwell, and Holkham; on the 23rd at Eign and Lampeter; on the 24th at Hartwell; on the 25th at Belvoir; on the 26th at Belvoir, Nottingham, Stonyhurst, Scarborough, Bywell, and Durham; on the 27th at Wakefield, Scarborough, Bywell, and Durham; on the 28th at Bicester, Hartwell, Belvoir, Nottingham, and Bowdon; and on the 29th at Ryde and Hastings. On the 14th June at Knebworth; on the 19th at Lampeter and Nottingham; on the 20th at Paddington, Oxford, and Royston; and on the 27th at Grantham.

Lightning was seen, but thunder was not heard, on the 13th April at Rose Hill; and on the 25th at Nottingham. On the 3rd May at Rose Hill; on the 12th at Patrixbourn; on the 21st at Bicester; and on the 22nd at Bicester and Oxford. On the 8th June at Worcester.

Hail fell on the 4th April at Nottingham, Hawarden, Scarborough, Allenheads, and North Shields; on the 5th at Norwich; on the 6th at Patrixbourn, Clifton, Paddington, Rose Hill, Bicester, Berkhampstead, Knebworth, Royston, and Isle of Man; on the 7th at Holkham and Scarborough; on the 9th at Guernsey and Patrixbourn; on the 26th at Knebworth, Lampeter, and Allenheads; on the 27th at Hawarden and Allenheads; on the 28th at Ryde, Nottingham, Stonyhurst, Allenheads, and North Shields; on the 29th at Lambeth, Lampeter, Hawarden, and North Shields; and on the 30th at Teignmouth, Patrixbourn, Lambeth, Bicester, Berkhampstead, Oxford, Knebworth, Norwich, Nottingham, Allenheads,

1856.	Temperature of										Elastic Force of Vapour.		Weight of Vapour in a Cubic Foot of Air.	
	Air.			Evaporation.		Dew Point.		Air—Daily Range.		Water of the Thames.				
Months.	Mean.	Diff. from Average of 85 Years.	Diff. from Average of 15 Years.	Mean.	Diff. from Average of 15 Years.	Mean.	Diff. from Average of 15 Years.	Mean.	Diff. from Average of 15 Years.		Mean.	Diff. from Average of 15 Years.	Mean.	Diff. from Average of 15 Years.
	°	°	°	°	°	°	°	°	°	°	In.	In.	Gr.	Gr.
April.....	46·8	+0·7	+0·2	43·0	−0·6	38·7	−1·5	19·1	+1·4	50·0	·235	−·014	2·7	−0·4
May	49·5	−2·9	−3·5	46·2	−3·1	42·9	−2·7	16·5	−2·8	53·4	·276	−·030	3·1	−0·4
June	58·5	+0·5	−0·4	55·0	+0·6	51·8	+1·4	20·8	+0·8	62·4	·385	+·019	4·3	+0·3
Mean.....	52·3	−0·6	−1·2	48·1	−1·0	44·5	−0·9	18·8	−0·2	55·3	·299	−·008	3·4	−0·2

1856.	Degree of Humidity.		Reading of Barometer.		Weight of a Cubic Foot of Air.		Rain.		Daily Horizontal Movement of the Air.	Reading of Thermometer on Grass.				
										Number of Nights it was			Lowest Reading at Night.	Highest Reading at Night.
Months.	Mean.	Diff. from Average of 15 Years.	Mean.	Diff. from Average of 15 Years.	Mean.	Diff. from Average of 15 Years.	Amnt.	Diff. from Average of 40 Years.		At or below 30°.	Between 30° and 40°.	Above 40°.		
			In.	In.	Gr.	Gr.	In.	In.	Miles.				°	°
April.....	74	− 5	29·615	−·136	542	− 2	2·3	+0·5	132	18	7	4	16·0	47·0
May	77	0	29·647	−·124	539	+ 2	3·5	+1·4	148	3	18	9	20·1	47·1
June	79	+ 5	29·877	+·088	533	+ 2	1·6	−0·3	76	1	9	20	31·2	56·1
Mean.....	77	0	29·713	−·057	538	+ 1	Sum 7·4	Sum +1·6	119	Sum 22	Sum 34	Sum 33	16·0	56·1

Note.—In reading this table it will be borne in mind that the sign (−) minus signifies below the average, and that the sign (+) plus signifies above the average.

and North Shields. On twenty different days in May, and frequently fell at many places on the same day, and it fell on June 13th, 14th, 19th, and 20th chiefly in the south of England.

Lunar Halos were seen on the 9th April at Patrixbourn, Lewisham, and Cardington; on the 11th at Lambeth and Cardington; on the 13th at Patrixbourn; and on the 14th at Stonyhurst. On the 10th May at Truro; on the 14th at Cardington; on the 17th at Knebworth; on the 20th at Hartwell and Nottingham; and on the 21st at Cardington; on the 10th and 11th June at Knebworth.

An aurora was seen on the 8th April at Clifton.

Solar Halos were seen on the 2nd April at Knebworth; on the 4th at Clifton; on the 14th at Clifton and Knebworth; on the 15th at Nottingham; on the 24th at Culloden; and on the 25th at Clifton and Hartwell On the 6th May at Knebworth; on the 7th at Grantham; on the 8th at Nottingham; on the 10th at Knebworth; on the 17th at Nottingham; on the 20th at Clifton; and on the 21st at Berkhampstead and Nottingham. On the 4th and 5th June at Knebworth; on the 6th at Clifton; on the 10th at Nottingham; on the 11th at Grantham; and on the 29th at Nottingham.

Snow fell on the 4th April at Nottingham and Allenheads; on the 17th at Allenheads; on the 19th at Battersea; on the 26th at Stonyhurst and Allenheads; on the 27th at Berkhampstead, Knebworth, Stonyhurst, and Allenheads; on the 28th at Grantham, Allenheads, and North Shields; and on the 29th and 30th at Allenheads. On the 1st May at Maidstone, Stonyhurst, Allenheads, and North Shields; on the 3rd at Knebworth and North Shields; on the 4th at Allenheads; and on the 6th at Durham.

Fog was prevalent at one or more stations on sixteen days in April; on seventeen days in May; and on eleven days in June.

Swallows first seen on the 6th April at Bowdon; on the 10th at Helston; on the 13th at Hartwell; on the 15th at Battersea and Grantham; on the 17th at Jersey and Stonyhurst; on the 22nd at Cardington and Belvoir; on the 23rd at Patrixbourn and Bicester; on the 24th at Berkhampstead and Royston; on the 25th at Clifton and Nottingham; and on the 26th at Scarborough. On the 4th May at Guernsey; on the 9th at Oxford; and on the 16th at Hawarden.

Cuckoo first heard on 13th April at Guernsey and Allenheads; on the 17th at Jersey; on the 20th at Clifton and Bicester; on the 22nd at Cardington; on the 24th at Eign; on the 25th at Patrixbourn and Hartwell; on the 26th at Royston and Bowdon; on the 27th at Scarborough; on the 28th at Nottingham. On the 1st May at Newport; on the 4th at Teignmouth and Lampeter; on the 9th at Berkhampstead; on the 10th at Stonyhurst; on the 12th at Grantham; and on the 13th at Hawarden.

Nightingale first heard on the 13th April at Newport; on the 16th at Bicester; on the 18th at Patrixbourn; on the 22nd at Cardington; and on the 28th at Hartwell and Nottingham.

Wheat in ear on the 10th June at Jersey; on the 16th at Battersea; on the 17th at Holkham; on the 18th at Helston: on the 20th at Rose Hill; on the 22nd at Newport and Oxford; and on the 23rd at Berkhampstead.

Lilac in flower on the 18th April at Jersey; on the 24th at Helston; on the 26th at Guernsey. On the 7th May at Newport; on the 10th at Bicester; on the 12th at Oxford; on the 13th at Clifton; on the 18th at Patrixbourn; on the 19th at Eign; on the 20th at Berkhampstead; on the 23rd at Hawarden; on the 24th at Nottingham; on the 25th at Stonyhurst; on the 27th at Bowdon; and on the 29th at Hartwell.

Barley in ear on the 26th June at Helston, Oxford, and Nottingham; on the 27th at Berkhampstead; and on the 28th at Battersea.

Laburnum in flower on the 20th May at Bicester; on the 22nd at Eign; on the 27th at Berkhampstead; on the 28th at Bowdon; on the 29th at Patrixbourn and Hartwell. On the 7th June at North Shields.

Meteorological Table, Quarter ended June 30th, 1856.

Names of Stations.	Mean Pressure of Dry Air reduced to the Level of the Sea.	Highest Reading of the Thermometer.	Lowest Reading of the Thermometer.	Range of Temperature in the Quarter.	Mean Monthly Range of Temperature.	Mean Daily Range of Temperature.	Mean Temperature of the Air.	Mean Degree of Humidity.	Wind.					Mean Amount of Cloud.	Rain.	
									Mean estimated Strength.	Relative Proportion of					Number of Days on which it fell.	Amount collected.
										N.	E.	S.	W.			
	in.	°	°	°	°	°	°									in.
Jersey	29·640	74·0	40·0	34·0	26·7	9·8	51·3	78	1·6	....	....	....	....	4·4	32	6·9
Falmouth	....	82·0	37·0	45·0	32·0	15·2	52·7	....	1·9	....	....	....	....	6·2	45	10·6
Truro	29·576	82·0	31·0	51·0	37·7	15·9	51·6	79	1·6	....	....	....	....	6·4	41	9·6
Teignmouth	29·611	75·0	31·3	43·7	33·4	15·3	50·9	74	0·6	29	40	59	53	5·6	40	7·1
Exeter	29·616	86·0	31·8	54·2	31·8	18·5	52·5	71	1·5	36	9	27	16	6·0	40	6·5
Newport	29·586	85·7	28·2	57·5	43·0	18·5	51·6	81	2·3	21	12	22	29	5·2	34	9·6
Clifton	29·567	79·2	29·7	49·5	40·6	16·3	50·2	84	1·0	50	24	35	53	5·8	38	8·3
Royal Observatory	29·596	83·1	29·8	53·3	42·3	18·8	50·5	79	....	27	11	26	26	7·4	38	7·4
Rose Hill	29·582	83·3	28·3	55·0	41·5	19·8	50·9	79	1·9	....	....	....	....	6·6	38	7·7
Oxford	29·601	82·0	27·0	55·0	41·1	16·4	50·7	81	1·6	....	....	....	....	7·6	40	9·3
Hartwell Rectory	29·518	84·8	29·7	55·1	42·4	18·6	51·1	87	1·2	42	32	41	67	6·2	43	7·7
Royston	29·622	86·3	26·4	59·9	45·6	18·5	51·2	76	....	55	11	44	63	6·6	53	5·5
Lampeter	29·605	82·0	25·3	56·7	45·9	19·8	50·0	81	0·7	40	22	46	56	6·3	49	8·8
Norwich	29·571	76·5	28·0	48·5	39·8	18·2	50·9	82	2·0	....	....	....	....	6·2	41	5·4
Derby	29·521	81·0	28·0	53·0	38·7	17·9	49·3	77	....	....	....	....	....	....	45	7·0
Holkham	29·605	86·6	28·5	58·1	39·7	16·2	50·8	76	1·5	18	18	25	30	....	39	4·2
Nottingham	29·602	84·2	28·5	55·7	42·2	18·3	56·9	89	0·4	....	....	....	....	7·3	51	7·7
Hawarden	29·580	73·5	32·0	41·5	32·5	12·6	49·3	81	1·5	....	....	....	....	7·5	30	5·5
Liverpool	29·618	70·7	36·4	34·3	27·6	11·7	49·9	82	0·9	....	....	....	....	7·1	30	5·1
Manchester	29·564	78·3	28·8	49·5	42·3	19·0	50·9	80	....	21	21	19	30	7·2	47	8·8
Wakefield	29·595	79·9	25·7	54·2	45·3	18·7	50·2	76	1·6	53	31	30	64	7·4	50	8·8
York	29·550	78·5	26·5	52·0	37·2	14·5	48·1	83	....	....	....	....	....	....	40	8·1
Scarborough	....	77·0	33·4	43·6	27·3	9·0	47·4	82	2·1	42	68	37	29	....	39	7·6
Durham	29·598	76·9	30·0	46·9	31·1	11·4	45·6	87	1·8	....	....	....	....	8·4	44	9·2
North Shields	29·683	77·2	32·0	45·2	28·0	10·3	45·9	91	1·9	53	52	37	35	6·7	56	16·4

REVENUE.

An Abstract of the Net Produce of the Revenue of the United Kingdom *in the Years and Quarters ended 30th June, 1855 and 1856; showing the Increase or Decrease thereof.*—(*Continued from page* 196.)

Sources of Revenue.	Years ended 30th June.			
	1855.	1856.	Increase.	Decrease.
	£	£	£	£
Customs	22,478,883	23,130,444	651,561	....
Excise	17,642,572	17,552,778	....	89,794
Stamps	7,359,832	7,062,115	....	297,717
Taxes	3,091,375	3,097,026	5,651	....
Property Tax	11,665,290	15,187,953	3,522,663	....
Post Office	2,719,000	2,768,152	49,152	....
Crown Lands	270,572	282,516	11,944	....
Miscellaneous	901,904	1,150,064	248,160	....
Totals	66,129,428	70,231,048	4,489,131	387,511
			Net Increase £4,101,620	

Sources of Revenue.	Quarters ended 30th June.			
	1855.	1856.	Increase.	Decrease.
	£	£	£	£
Customs	5,768,309	5,864,724	96,415	....
Excise	4,763,374	5,005,000	241,626	....
Stamps	1,871,978	1,858,083	....	13,895
Taxes	1,346,031	1,343,026	....	3,005
Property Tax	2,259,756	2,376,751	116,995	....
Post Office	725,000	716,000	....	9,000
Crown Lands	63,000	64,000	1,000	....
Miscellaneous	325,772	317,688	....	8,084
Totals	17,123,220	17,545,272	456,036	33,984
			Net Increase £422,052	

An Account showing the Net Revenue and other Receipts of the Quarter ended the 30th of June, 1856; the Application of the same, and the Charge of the Consolidated Fund for the said Quarter, together with the Surplus or Deficiency upon such Charge.

	£		£
Surplus balance beyond the charge of the Consolidated Fund, for the quarter ended March 31st, 1856, viz.:—		Amount applied out of the net income for the quarter ended June 30th, 1856, to redemption of Exchequer Bills (Deficiency) for the quarter ended March 31st, 1856, less portion of charge transferred to Ireland	2,569,109
Great Britain			
Ireland £647,831			
	647,831		
Balance of Money received under the Act for Funding Exchequer Bills	159,000	Exchequer Bills redeemed with money received under the Act for Funding Exchequer Bills	306,538
Income received in the quarter ended June 30th, 1856, as shown in page 300	17,545,272	Amount applied out of the Income to supply services, in the quarter ended June 30th, 1856	15,508,135
Amount received in the quarter ended June 30th, 1856, in full of First Loan of £5,000,000	1,499,000		
Ditto, in part of Second Loan of £5,000,000	2,500,000		
Money received in lieu of Exchequer Bills, in part of Funding of £3,000,000	149,724		
Amount received in the quarter ended June 30th, 1856, in repayment of advances for Public Works, &c.	374,471		
	22,875,298		
Balance, being the deficiency on the 30th June, 1856, upon the charge of the Consolidated Fund in Great Britain, to meet the Dividends and other Charges payable in the quarter to Sept. 30th, 1856, and for which Exchequer Bills (Deficiency) will be issued in that quarter	3,584,645	Charges of the Consolidated Fund for the quarter ended June 30th, 1856, viz.:—	
		Interest of the Permanent Debt £6,248,993	
		Terminable Debt 688,987	
		Interest of Exchequer-Bills (Deficiency) 10,633	
		The Civil List 100,170	
		Other charges on Consolidated Fund 360,911	
		Advances for Public Works, &c. 324,700	
			7,734,394
		Balance of Money received under the Act for Funding Exchequer Bills, carried to Revenue	2,186
		Surplus Balance beyond the charge of the Consolidated Fund, for the quarter ended June 30th, 1856, viz.:—	
		Great Britain	
		Ireland 339,581	
			339,581
	£26,459,943		£26,459,943

CORN.

Average Prices of Corn per Imperial Quarter in England and Wales, during each Week of the Second Quarter of 1856; *together with the Monthly and Quarterly Average.*—(*Continued from p.* 198.)

[Communicated by H. F. Jadis, Esq., Comptroller of Corn Returns.]

Weeks ended on a Saturday, 1856.	Weekly Average.					
	Wheat.	Barley.	Oats.	Rye.	Beans.	Peas.
	s. *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*
April 5	69 5	38 8	23 6	44 7	40 7	39 7
„ 12	68 7	39 0	23 8	42 4	41 4	37 10
„ 19	69 0	39 2	23 7	44 7	41 9	37 4
„ 26	67 11	39 11	23 4	40 3	41 4	39 2
Average for April	68 9	39 2	23 6	42 11	41 3	38 6
May 3	66 6	40 5	22 9	38 11	41 11	39 0
„ 10	67 7	40 3	23 10	43 7	41 3	38 5
„ 17	68 9	40 0	23 5	41 4	41 7	39 11
„ 24	69 2	39 6	23 10	43 7	41 6	38 2
„ 31	68 2	38 11	23 10	47 6	42 2	39 11
Average for May	68 0	39 10	23 6	42 9	41 8	41 1
June 7	67 9	38 7	24 3	42 10	42 8	39 9
„ 14	68 1	38 6	24 3	47 9	43 5	40 11
„ 21	69 11	38 4	24 7	44 4	42 9	41 0
„ 28	72 6	38 5	25 9	48 10	44 0	42 9
Average for June	69 7	38 5	24 8	45 11	43 2	41 1
Average for the Quarter ..	68 8	39 2	23 10	43 7	42 0	39 6

STOCKS AND SHARES.

Fluctuations in the Stock and Share Markets during the Months of April, May, and June, 1856.—(*Continued from p.* 198.)

Stocks and Shares.	Amt. of Share.	Amt. Paid.	Price on the			Highest Price during the Months of			Lowest Price during the Months of		
			1 April.	2 May.	2 June.	April.	May.	June.	April.	May.	June.
Consols	...	...	93⅛	92⅜	93¼	93½	95⅛	95⅝	91⅞	92¼	92½
Exchequer Bills	...	...	1*s.* to 4*s.* Pm.	Par.	2*s.* to 4*s.* Pm.	4*s.* Pm.	3*s.* Pm.	15*s.* Pm.	Par.	6*s.* Dis.	3*s.* Pm.
Railways.											
Brighton	Stock	100	103½	102	103½	104	103¾	110	101½	101¼	103½
Caledonian	„	100	61¼	60	61¼	61½	61¾	63⅜	59¼	59	61
Eastern Counties	„	20	10½	9⅞	10⅛	10½	10¼	11⅜	9⅝	9¾	10
Great Northern	„	100	95	95	95½	95¼	96¼	97½	93¾	94	94⅛
Great Western	„	100	64¾	61¼	60¾	65½	62½	64¼	60½	59½	60⅝
London & North-Western	„	100	102½	100¼	102¼	102¾	103	108	99½	102½	101¾
Midland	„	100	75	73⅝	79¼	75½	80	85⅝	72⅜	73⅝	78
Lancashire and Yorkshire	„	100	88¼	88¼	93¼	89⅜	93⅞	99½	87	88	92⅛
North Staffordshire	20	17½	11¾	11¼	11½	12	11¾	12¼	11	11¼	11½
South-Eastern	Stock	100	74	71⅝	72½	74	73⅛	77½	70½	69¾	71¼
South-Western	„	100	95½	94½	98½	96	100	108¾	93¼	94	98½
York, Newcastle, & Berwick	„	100	79½	77¾	82½	80	83	90½	76½	77¾	80¾
York and North Midland..	„	100	57½	55½	59½	57½	60	64½	54½	55¼	58¼
Northern of France	20	16	39¾	43	45¼	43⅜	46⅜	45½	39¾	43	43⅝
East Indian	20	20	22⅝	23½	24	24	24⅛	24½	22¼	22⅞	23¾

CURRENCY.

Bank of England.

An Account, pursuant to the Act 7th and 8th Victoria, c. 32, for each Week ended on a Saturday, for the Second Quarter of 1856.—(*Continued from p.* 199.)

[Compiled from the "Bankers' Magazine."]

ISSUE DEPARTMENT.

Date.	Notes Issued.	Notes in hands of Public.	Government Debt.	Other Securities.	Gold Coin and Bullion.	Silver Bullion.
1856.	£	£	£	£	£	£
April 5 ...	23,915,280	19,444,805	11,015,100	3,459,900	9,440,280	...
„ 12 ...	23,905,130	20,010,090	11,015,100	3,459,900	9,430,130	...
„ 19 ...	23,683,205	20,014,605	11,015,100	3,459,900	9,208,205	...
„ 26 ...	23,556,675	19,924,220	11,015,100	3,459,900	9,081,675	...
May 3 ...	23,656,440	20,225,565	11,015,100	3,459,900	9,181,440	...
„ 10 ...	23,633,820	19,942,830	11,015,100	3,459,900	9,158,820	...
„ 17 ...	23,673,615	19,536,940	11,015,100	3,459,900	9,198,615	...
„ 24 ...	24,413,875	19,331,915	11,015,100	3,459,900	9,938,875	...
„ 31 ...	25,241,040	19,554,360	11,015,100	3,459,900	10,766,040	...
June 7 ...	25,532,095	19,579,360	11,015,100	3,459,900	11,057,095	...
„ 14 ...	25,912,210	19,233,750	11,015,100	3,459,900	11,437,210	...
„ 21 ...	26,237,940	19,322,560	11,015,100	3,459,900	11,762,940	...
„ 28 ...	26,903,970	19,515,255	11,015,100	3,459,900	12,428,970	...

BANKING DEPARTMENT.

Date.	Proprietors' Capital.	Rest.	Public Deposits.	Other Deposits.	Seven Day and other Bills.	Total Dr.
1856.	£	£	£	£	£	£
April 5 ...	14,553,000	3,840,005	6,010,439	11,510,329	757,025	36,670,798
„ 12 ...	14,553,000	3,156,745	3,443,136	12,314,701	808,960	34,276,542
„ 19 ...	14,553,000	3,167,890	2,958,753	11,907,623	796,057	33,383,323
„ 26 ...	14,553,000	3,175,991	4,008,071	11,036,793	845,327	33,619,182
May 3 ...	14,553,000	3,207,670	3,871,799	10,806,090	819,105	33,257,664
„ 10 ...	14,553,000	3,233,367	3,033,588	10,613,914	836,812	32,270,681
„ 17 ...	14,553,000	3,246,963	2,991,956	12,351,097	787,137	33,930,153
„ 24 ...	14,553,000	3,254,763	3,535,203	11,472,481	742,904	33,558,351
„ 31 ...	14,553,000	3,201,190	3,686,524	10,745,271	773,848	32,959,833
June 7 ...	14,553,000	3,209,246	3,297,127	10,734,513	805,604	32,599,490
„ 14 ...	14,553,000	3,214,987	4,112,448	10,218,761	774,393	32,873,589
„ 21 ...	14,553,000	3,231,001	4,132,110	10,602,674	739,629	33,258,414
„ 28 ...	14,553,000	3,248,455	5,704,570	9,810,045	797,546	34,113,616

Date.	Government Securities.	Other Securities.	Notes.	Gold and Silver Coin.	Total Cr.
1856.	£	£	£	£	£
April 5 ...	11,871,778	19,711,720	4,470,475	616,825	36,670,798
„ 12 ...	12,918,437	16,794,528	3,895,040	668,537	34,276,542
„ 19 ...	13,117,833	15,929,363	3,668,600	667,527	33,383,323
„ 26 ...	13,370,083	15,975,189	3,632,455	641,455	33,619,182
May 3 ...	13,755,083	15,446,266	3,430,875	625,440	33,257,664
„ 10 ...	12,662,652	15,297,277	3,690,990	619,762	32,270,681
„ 17 ...	12,479,416	16,710,812	4,136,675	603,250	33,930,153
„ 24 ...	12,479,416	15,377,046	5,081,960	619,929	33,558,351
„ 31 ...	12,612,119	14,042,418	5,686,680	618,616	32,959,833
June 7 ...	11,682,126	14,353,306	5,952,735	631,323	32,599,490
„ 14 ...	11,226,468	14,347,079	6,678,460	621,582	32,873,589
„ 21 ...	11,276,155	14,411,854	6,915,380	655,025	33,258,414
„ 28 ...	11,276,155	14,803,958	7,388,715	644,788	34,113,616

CURRENCY.—*Continued.*

Country Banks.

Average amount of Promissory Notes in Circulation in England and Wales in each Week ended on a Saturday, for the Second Quarter of 1856.—(*Continued from page* 200.)

[Compiled from the "Bankers' Magazine."]

England and Wales.

Date.	Private Banks.	Joint Stock Banks.	Total.
1856.	£	£	£
April 5	3,990,730	3,144,551	7,045,281
,, 12	3,948,337	3,143,670	7,092,000
,, 19	3,944,703	3,172,172	7,116,875
,, 26	3,931,841	3,170,000	7,101,841
May 3	3,936,552	3,136,658	7,073,210
,, 10	3,910,514	3,112,621	7,023,135
,, 17	3,900,466	3,131,429	7,031,895
,, 24	3,840,811	3,101,428	6,942,239
,, 31	3,778,093	3,035,212	6,813,305
June 7	3,742,972	2,997,600	6,740,572
,, 14	3,726,853	3,005,866	6,732,719
,, 21	3,718,517	3,027,607	6,746,124
,, 28	3,741,439	3,055,433	6,796,872

Fixed Issues—Private Banks, £4,570,931; Joint Stock Banks, £3,316,143.

Average amount of Promissory Notes in Circulation in Scotland and Ireland during the Four Weeks ended the 12*th of April, the* 10*th of May, and the* 7*th of June,* 1856.—(*Continued from page* 200.)

Scotland.

Date.	£5 and above.	Under £5.	Total.
1856.	£	£	£
April 12	1,302,189	2,481,189	3,783,383
May 10	1,418,553	2,520,442	3,938,996
June 7	1,666,004	2,806,753	4,472,759

Ireland.

Date.	£5 and above.	Under £5.	Total.
1856.	£	£	£
April 12	3,130,833	3,343,907	6,474,742
May 10	3,236,317	3,275,595	6,511,913
June 7	3,256,430	3,107,947	6,364,379

Fixed Issues—Scotland, £3,087,209; Ireland, £6,354,494.

QUARTERLY JOURNAL

OF THE

STATISTICAL SOCIETY.

DECEMBER, 1856.

British Association for the Advancement of Science. Twenty-sixth Meeting, 1856. (*Cheltenham.*)

Section F.—Economic Science and Statistics.

[Opening Address by Lord Stanley, M.P., President of the Section.]

I BELIEVE it will be my duty to open the proceedings of this Section by a few words relative to the purpose of our meeting; and I must begin by observing, that the remarks which follow were prepared before the passing of that resolution of yesterday, which has enlarged the scope of our duties so as to include, in addition to Statistics, properly so called, Economic Science in general.

It is needless in this presence to define, at any length, the nature or the object of statistical science. The axiom on which that science is based may be stated thus: that the laws by which nature is governed, and more especially those laws which operate on the moral and physical condition of the human race, are constant, and are, in all cases, best discoverable—in some cases only discoverable—by the investigation and comparison of phenomena extending over a very large number of individual instances. In dealing with the individual human being every thing is uncertainty: in dealing with MAN in the aggregate, results may be calculated with the precision and accuracy of a mathematical problem. To take a familiar instance,—the length of a single life can never be known beforehand; but by the accurate keeping of returns the aggregate length of ten thousand or a hundred thousand lives is easily ascertained. This aggregate length, the conditions of life being generally the same, approximates to a constant quantity, however often the experiment be repeated; and from that quantity, thus obtained, we deduce an average which, as the experience of every insurance office shows, is near enough to the truth for ordinary purposes of calculation. Accidental diversities, whether of internal constitution or of external circumstances, tend to neutralize one another. Their influence diminishes as the area of investigation increases, until, if that area be sufficiently extended, we are justified in disregarding them altogether, and in admitting as approximately, if not as absolutely, true, the general inference to which our successive trials point. I will not lead you into those strange and startling conclusions to which Quetelet has come, which, comparing some of the averages obtained with one another, and

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representing them in mathematical form, he finds in the laws thus discovered a close resemblance to, perhaps an actual identity with, those which operate in physics; as, for instance, when he lays it down that the obstacles which oppose the increase of population act in a manner exactly the same as does the resistance of the medium in which a body moves to the motion of that body. Wide as is the field of thought which such a suggestion opens, it must probably be, for many years, premature to enter it: the laws as yet made known to us by statistical research are too few to allow of generalisation relative to their mutual inter-connection. Enough to cite the dictum of Quetelet, confirmatory of what was said above, "All observation tends to confirm the truth of this proposition, that that which concerns the human race, considered collectively, is of the order of physical facts: the greater the number of individuals, the more completely does the will of individuals disappear, and allow the series of general facts, which depend upon the causes by which society exists and is preserved, to predominate. . . . . We must admit, that on submitting to careful experiment unorganized bodies, and the social system, we are unable to say on which side causes act in their effects with the greatest regularity."

This, then, is the first characteristic of statistics as a science: that it proceeds wholly by the accumulation and comparison of registered facts;—that from these facts alone, properly classified, it seeks to deduce general principles, and that it rejects all *à priori* reasoning, employing hypothesis, if at all, only in a tentative manner, and subject to future verification. It starts from the assumption, verified by many trials, that human action, fluctuating as regards the human UNIT, is approximately invariable as regards the masses which make up society. But there is another aspect in which it may be considered. As a rule, the degree of certainty which attends any science is exactly proportioned to the extent to which such science admits of the application of numbers. We know what has been done for chemistry by the discovery of a single numerical law—the theory of definite proportions—turning, by one stroke, into a science what was before little more than a collection of important but detached observations. And what we aim at in statistics is, to substitute for vague phrases, intended to express certain qualities, arithmetical formulæ by which the same idea may be conveyed with a precision to which language alone cannot attain. For instance, the uneducated man, speaking of a climate or season of the year, will say only that it is warm, hot, or very hot; the statistician registers the temperature of each day, strikes an average, and gives his result, in numerical form, extending, it may be, over a period of several years, and calculated, accordingly, with the most absolute accuracy of which human investigation is capable. Again, the traveller, in describing a nation which he has visited, writes that offences of violence are exceedingly common, probably more so than in any other country; the statistician obtains returns of convictions, distinguishes the different classes of crime, ascertains the per-centage of murders, or assaults, per head, on the total population, allows for the probable amount of undetected criminality, and finally compares these results with others similarly obtained in other parts of the world.

When, therefore, in discussing social questions, we apply the statistical test, we are really doing nothing more than appealing from imagination to fact—from conjecture to certainty—from an imperfect to a perfect method of observation. In the principle, strictly speaking, there is no novelty: every sensible and observing man who has lived in a civilized state of society has been, to some extent, a statistician; the novelty consists, first, in the greater accuracy with which, and the enlarged scale on which, facts can be collected in modern Europe; and, secondly, in the practical application of that theory, which, to philosophers must, from the analogy of inanimate nature, have always appeared probable—the theory, namely, that organized beings, taken in the aggregate, are governed in their acts by determinate and discoverable laws.

It is obvious that in a science of this kind, unlike many which have occupied the attention of mankind, little room is left for imagination, and as little for error. On the first ground, the study is unattractive even to many who appreciate its value; on the second, it is eminently and necessarily progressive. "Hypotheses non fingo," —those memorable words of Newton's—should be written over the door of every Statistical Society in Europe. Nor is there any branch of mental exertion so calculated to promote a cosmopolitan habit of thought and feeling. Man is the object studied; and man, so studied, is seen to vary in different countries only in consequence of discoverable influencing causes, such as race, climate, food, laws, modes of life, &c. However great, therefore, the external differences between branches of the human family, the tendency of sociology is to eliminate these differences one by one, to refer each of them to its several specific origin, and thus finally to bring to light the essential unity of type which underlies them all.

I would also observe, that as an experimental science, the progress of statistics is not liable to those delays which impede the advance of many other branches of knowledge. Where, as in mathematics, the work to be done is transacted necessarily and exclusively within the mind of the discoverer,—where, not the quantity, but the quality of intellect brought to bear is all-important,—great advances are rare, for the plain reason that they can only be made by men of extraordinary capacities. No number of ordinary proficients in mathematics, working jointly, can make up for the absence, or supply the place, of one Newton. But though not one man in ten thousand can be distinguished as an analyst or a geometer, the number is far larger of those who possess the mental requisites for statistical investigation, at least in its simpler forms: and without disparaging the remarkable talent for arrangement and generalisation evinced by such men as Quetelet, and by some of our own countrymen whom I will not here mention, it may be safely affirmed that the extension of statistical inquiry depends less on the appearance among us of any one mind of more than common power, than on the sustained and co-operative industry, encouraged by the State, of many minds trained to this pursuit, and each taking a separate and distinct department in which to labour.

It is almost superfluous to point out the sources of those errors which most beset statisticians. They may, I think, be reduced under

two heads: (1.) Calculation of mean results from an insufficient number of data; a fault, from the effects of which, in finances, many provident societies are suffering grievously: (2.) Calculation of mean results without sufficient care being taken to eliminate disturbing causes: whether this omission arises from the classing together of phenomena essentially distinct, and referable to separate laws, or from omitting to make allowance for imperfections in the data supplied, *e. g.*, as though one engaged on criminal statistics were to assume that all offences committed were actually brought to light, overlooking those in which no detection follows, and, consequently, in which no trial takes place. Neither of the sources of error which I have mentioned are difficult to avoid. The one danger against which they warn us is that of premature conclusions. In all physical science, but in no science more than this of which we treat is suspension of judgment necessary. I mean by the phrase, that temper of mind which says, "I neither believe nor disbelieve; evidence is wanting to do either. I only wait and hold myself free from bias until further facts are adduced." How easy this is in theory,—how hard and painful in practice need not be told to any one who has given time, and thought, and toil to the proof or disproof of a scientific hypothesis.

Time would not allow me to attempt even the most rapid and hasty survey of what has been done, and of what yet needs doing, in the way of statistical research. Generally,—I think we may say this of the progress of the science in England,—that what defects remain arise principally from causes beyond the control of individuals. Statistics are the function of the State in a sense in which no other science is so. The details of population, of employment, of instruction, of religious worship, of commerce, and of health, are already recorded in official publications; those of agricultural production we may hope will shortly follow. The branch which I principally note as deficient is that which relates to civil and criminal judicature. Lord Brougham has brought this subject before the House of Lords, and even embodied in a Bill the data on which information is needed. We require a regular and uniform record to be kept of every fact connected with the administration of the law. We require to know, in civil proceedings especially, the number and nature of suits that go to each court, the length of time occupied in their decision, the nature of that decision, and the cost to the parties. Our criminal returns might be fuller than they are: they give us at present absolutely no information respecting that vast class of offences (of late much increased,) which are dealt with under summary jurisdiction. It is not wise in any country to copy servilely the practice of another: local differences may create and necessitate diversity of procedure. But I may refer to the annual reports (two yearly volumes,) of the Minister of Justice in France, as examples of an almost perfect arrangement of complicated statistical details. One result of that publication is to show a vast local difference between department and department in the nature and amount of crime. It is obvious, that when such a difference is shown, by the lapse of a sufficient period, to be chronic and not merely casual, the Government, whose attention is thus invited, must feel itself bound to investigate the source of the evil, and, if

possible, to provide a cure. In fact, an executive regularly supplied with such knowledge may be said to have its finger on the pulse of every province, ready, at the first symptom of disease, to intervene with the requisite remedy.

There is another suggestion which I may make, and which indeed connects itself with this last. I allude to the advantage, I might almost say the necessity, of establishing a Statistical Department of Government, charged with the annual publication of such facts relative to the management of national affairs, as are reducible to numerical expression. We have statistics enough presented to Parliament every session, but they are, in the great majority of cases, called for by individuals. They are drawn out to suit the particular purpose of those who move for them: they are, accordingly, deficient in unity, and often of no use beyond the moment. Now I speak from some personal observation when I say, that at a cost hardly greater than that of these desultory, fragmentary, isolated returns, (which have in addition the inconvenience, coming, as they do, at unexpected times, and without any regularity, of throwing a sudden increase of work on particular offices,) it would be possible to present to the nation such a yearly *resumé* of administrative statistics as should, to a very great degree, supersede the present system (if system it can be called,) of moving for returns as, and when, they are wanted.

I have said, that I think a Statistical Department desirable, instead of a Statistical Branch in every Department; because the former method gives better security for unity of plan, and because the work will be best done by those whose sole and undivided business it is.

I have not referred to the meetings of the International Congress of Brussels and Paris, because on such a subject I could offer no remark that would not naturally occur to those whom I address. Such meetings have a twofold value. First, they extend the field of statistical research: and we have seen that accuracy of result varies directly as the magnitude of the area of investigation. Secondly, they form a new link between nation and nation; because, though speech differs, arithmetical notation is the same everywhere. In proportion, therefore, as numerical is substituted for descriptive statement, we approach nearer to that otherwise impracticable dream of philosophers—a universal language.

There is, I believe I may state, a probability of the Congress of 1857 being held in London; an expectation which seems both natural and reasonable, inasmuch as it has been averred in public, and not denied, that the first design of holding such international meetings was suggested by the analogy of the Hyde Park Exhibition of 1851.

Should the event I allude to take place, it will become the duty of all concerned in statistical science to see that such an opportunity does not pass unimproved; so that 1858 may find us with a thoroughly organized system for the annual collection and publication of national facts, assimilated, if possible, to the systems of France and Belgium. For it must be borne in mind, that the objects to be aimed at are two: one, the adoption of a method as perfect in itself as possible; the other, the assimilation of that method to those which prevail elsewhere, so that nations may mutually profit by each other's experience.

As a proof how much such comparing of notes is required, I may

remind you that the census of Ireland and Scotland was taken in a manner different from that of England, while no attempt has ever been made to bring the entire British empire, including India and the colonies, under a single statistical organization.

The constitution of such a statistical department as we require is matter of fair discussion at the approaching Congress. Probably the most effective combination of working talent would be that obtained by the appointment of a Commission, or Board, to preside over the issuing of official publications, partly composed of scientific men, partly of members of the permanent or parliamentary administration, (the former preferably, as having more leisure,) who would bring in the necessary element of a knowledge of official customs. This is, I believe, the system actually existing in Belgium. In Prussia there is a Minister at the head of the Statistical Department. Those who wish to see the question more fully discussed will find information in a valuable Report by Dr. Farr to the Registrar-General, dated October, 1855, forming p. 108, *et seq.*, of the Registrar-General's Sixteenth Annual Report. It was also gone into at the Paris Congress of 1855, and a debate upon it will be found in the volume of proceedings.

I wish also to point out to the Association the advantage of such a communication between the Home Government and the leading British colonies, in reference to the approaching Congress, as may enable such of them as desire it to represent themselves by means of delegates.

Before I conclude, I should wish briefly to allude to a work in which the London Statistical Society is now engaged.

A Committee was appointed by this Society on the 25th January of this year to collect information relating to the Beneficent Institutions of the Metropolis. The class of institutions to which their attention was first directed was the Medical Charities; and the inquiry has already proceeded so far as to render it probable that the total income of the London hospitals and dispensaries, including the Samaritan and other funds connected with them, added to the strictly medical expenditure of the Poor-Law-Board for London, and the incomes of lunatic-asylums and alms-houses, will amount to a sum fully equally, when the difference of population is taken into account, to the expenditure of the hospitals and *hospices* of Paris.

I have now only to announce to you the papers about to be read, and to request attention to the following rules, laid down for the sake of brevity and clearness in our proceedings:

"To avoid reading long consecutive lists of figures, and, as far as possible, to give only results.

"Where money is in question, to avoid shillings and pence, stating only the number of pounds.

"Where large sums are concerned, to give round numbers, avoiding units."

Of course there is a medium in observing these directions; and if the choice lies between the two, better be obscure than inaccurate. All I mean to convey is, that over-minuteness in these matters is apt to defeat its own ends.

The present State of the Mining Industries of the United Kingdom. *By* Robert Hunt, Esq., F.R.S., *Keeper of Mining Records, Museum of Practical Geology.*

(Continued from p. 218.)

The present condition of Lead Mining will be seen by the following statement of the number of lead mines producing lead ore in each mineral county of the United Kingdom.

The quantities of lead and of silver obtained from the ore for 1854 were as follows: (*the returns for* 1855 *were not yet completed when this Paper was read.*)

	Counties.	Number of Mines.	Lead Ore.	Lead.	Silver.
			Tons.	Tons.	Ozs.
England.	Cornwall	35	7,460	5,005	179,675
	Devonshire	14	4,139	2,612	119,288
	Cumberland	75	9,890	6,662	42,020
	Durham and Northumberland	39	22,329	16,669	78,577
	Westmorland	7	383	289	80
	Derbyshire	not known*	7,554	4,508	....
	Shropshire	10	3,797	2,765	184
	Yorkshire	16	9,244	6,476	....
Wales.	Cardiganshire	42	7,034	4,948	33,418
	Caermarthenshire	4	901	666	....
	Denbighshire	2	1,824	1,363	1,455
	Flintshire	40	7,027	5,408	28,588
	Montgomeryshire	11	1,184	894	3,238
	Merionethshire	3	98	63	....
	Glamorganshire	2	62	45	352
	Isle of Man	2	2,800	2,137	52,262
Ireland.	Clare	3	165	121	6,650
	Down	1	1,379	1,084	....
	Louth	2	54	41	91
	Limerick	3	142	95	3,420
	Wicklow	4	2,228	869	7,935
Scotland.	Argyleshire	1	174	130	536
	Kirkcudbrightshire	4	522	383	570
	Lanarkshire	1	261	170	....
	Dumfriesshire	1	795	596	4,320
	Total	322	90,553	64,005	562,659

The lead mines of Devonshire, especially those at Coombe-Martin, and Beer-Alston, have been worked from a very early period, and there exist several old charters granting privileges to certain parties upon the payment of fixed royalties to the crown. Sir John Pettus, in his *Fodinæ Regales*, gives several of these. It is asserted that Edward the Black Prince took 500 miners from Derbyshire into Devonshire, and that the amount of wealth which he obtained in

* The uncertain mode of working in Derbyshire, the constant changes which occur, and the very small quantities of lead ore produced from single workings, render it very difficult to ascertain the number of mines.

that county was sufficient to cover the expenses of his wars in France. It is quite certain that a large quantity of lead ore, especially rich in silver, has, from time to time, been obtained from the Devonshire lead mines.

Lead mining in Cornwall may be said to be of very recent date, since, in the time of Pryce, scarcely any lead was worked. That author informs us that some ancient lead mines exist in Peran-Zabulo, and that, sixty years previously to the time of his writing, at Garres, in St. Allen, lead ore containing 100 ounces of silver to the ton was raised.

The Cardiganshire lead mines were worked by the Romans, and from the time of Henry VII. we have a tolerably complete account of the progress of mining operations in Wales. I have, in "*Notices of the History of the Lead Mines of Cardiganshire*," published in the "Memoirs of the Geological Survey," collected all the information obtainable upon those interesting mineral works. To that paper I must refer all who are interested in the subject.

The lead mines of northern England, especially those of Alston-Moor, appear to have been worked from a very early period. They have exemplified fully many of the uncertainties attending mining operations, fortunes having been lost and won within a very short period by different sets of adventurers.

The most extensive mineral property in England, in the hands of a single individual, is the mines of East and West Allendale and Weardale, the property of Mr. Blackett Beaumont, M.P. for Northumberland. The produce from those mines, in 1854, was 12,220 tons of lead ore, 9,200 tons of lead, and 49,000 ounces of silver. These mines are under the management of Mr. Thomas Sopwith, and they are, in all respects, remarkable examples of systematic order in every department.

The refining of silver from lead is a very ancient process, well described by the poet Job and the prophet Jeremiah. It consisted in oxidizing the lead in a properly constructed furnace, thus converting it into litharge or red-lead, the silver being left on the bed of bone ashes prepared to receive it. While this process was adopted in the north of England, if the lead contained less than 6oz. of silver to the ton, it was not found profitable to separate it; and, in Wales, if it contained less than 12oz., they did not refine the lead. The cost of refining lead, previously to the date of Mr. Pattinson's patent, was from 30*s.* to 60*s.* per ton. Mr. Hugh Lee Pattinson discovered a process of desilverization, by which it is now profitable to separate the silver when the ore does not contain more than 3oz. to the ton. Beyond this, more silver is obtained, as Pattinsonized lead never contains more than 7 dwts. of silver to the ton when the process is properly performed, while refined lead seldom contains less than an ounce per ton, and frequently much more.

The quantity of lead now raised is 64,000 tons per annum. Certainly from more than 30,000 tons of this lead the silver is extracted, which, without this process, would have been lost to the arts. This lead will hold from 5oz. to 8oz. of silver per ton, and yield not less than 200,000oz. of silver. On the lead formerly refined there is a saving of the value of at least 3oz. of silver on each ton of lead. The result of this discovery has therefore been the actual recovery of from

60,000*l.* to 70,000*l.* per annum formerly wasted. In the foregoing table, the quantities of silver given are those which have been received in returns obtained from the mines producing argentiferous galena. There are some from which returns have not been obtained, and we may fairly estimate the silver produce from the lead ores of this country as being not less than 790,000 ounces annually.

Of late years a large and steadily increasing trade has sprung up in the argentiferous copper ores and silver ores of South America. It is not possible to obtain any accurate account of the whole of this silver at present.

All copper ores, since 1853, have been imported free of duty; and these argentiferous ores pass into the hands of but two or three smelters without special notice. Some of the copper ores of this country contain silver, and the ores of a few of the Cornish mines regularly pass into the hands of the same smelters, who purchase them for the purpose of separating the more valuable metal. In 1855, the amount of silver ore imported was about 7,222 tons, and from this there was obtained 2,112,246 ounces of silver, worth upwards of 500,000*l.*

The import and export trade in lead shows that both have steadily increased.

Lead Imported.

	Ore.	Pig and Sheet.	Retained for Home Consumption.
	Tons.	Tons.	Tons.
1848.....	1,298	3,788	2,157
1849.....	1,380	7,215	5,265
1850.....	1,700	11,875	6,941
1851.....	2,790	14,591	8,235
1852.....	802	13,257	12,990
1853.....	733	17,564	....
1854.....	....	11,858	....

Lead Exported.

	Ore.	Pig and Sheet.	Shot.	Litharge, Red and White Lead.	Foreign Lead.
	Tons.	Tons.	Tons.	Tons.	Tons.
1848	135	4,977	1,151	2,292	3,747
1849	180	15,227	1,798	3,798	5,161
1850	165	20,165	1,750	4,717	3,217
1851	133	18,029	1,459	3,784	4,287
1852	195	18,641	1,355	3,389	2,966
1853	488	14,935	1,307	2,869	1,438
1854					

The Parliamentary returns of exports and imports for 1854 and 1855 remained, owing to an accidental omission, unpublished at the time of reading this Paper. In connection with the imports of lead, it may be stated that those from Spain exhibit the greatest increase. This is interesting and important, showing the improved value of the Spanish mines, and the advantages which that country is deriving from English industry.

Lead Ore and Lead Imported from Spain.

	Ore.	Lead.		Ore.	Lead.
	Tons.	Tons.		Tons.	Tons.
1845.....	11	2,186	1850.....	656	11,447
1846.....	59	6,517	1851.....	1,851	14,402
1847.....	....	3,267	1852.....	16	12,398
1848.....	51	3,447	1853.....	83	14,979
1849.....	110	6,210	1854.....	....	11,337

The prices of pig lead in the London market, since 1844, has been as follows:—

	£	s.	d.		£	s.	d.
1844.....	17	5	0	1850.....	17	15	0
1845.....	19	0	0	1851.....	16	10	0
1846.....	19	0	0	1852.....	17	0	0
1847.....	20	0	0	1853.....	23	10	0
1848.....	17	5	0	1854.....	23	10	0
1849.....	16	0	0	1855.....	24	0	0

Since the produce of silver from the British mines has engaged our attention, that of Gold must not be entirely neglected. Gold has been found in the tin streams of Cornwall, in some of the ores of Devonshire, particularly in the gozzans or iron-ochres which occur on the backs of mineral lodes. In Wales, gold has been found in Caermarthenshire, Cardiganshire, and Merionethshire. In the Lead Hills and some other parts of Scotland, and especially in Wicklow in Ireland.

A few words on the last named locality may not be out of place. In 1795, it transpired that lumps of pure gold had been picked up in a valley at the base of the Croghan Kinshela in Wicklow, and hundreds of gold-seekers swarmed along the banks of the stream in which the auriferous treasures were found, and for six weeks they appropriated to themselves a considerable amount of pickings. Then Government, backed by a special Act of Parliament, established a more systematic search, under the direction of Messrs. Mills, King, and Weaver. These works continued to the breaking out of the rebellion in 1798, when they were abandoned, and they were not resumed until 1801. The directors at this time determined on examining the rocks of the mountain itself from which the gold was supposed to be derived. An enormous amount of labour was bestowed on the work, but it was not rewarded by the discovery of even a trace of gold. The gold streaming and the gold mining were eventually abandoned by the Government. They had raised 944 ounces of gold, the ingots of which were $21\frac{3}{8}$ and $21\frac{7}{8}$ carats fine, the alloy being silver, the total value at the time being 3,675*l*. The heaviest lump found weighed 22 oz. The money expended upon these works cannot now be stated with any accuracy, but it is certain that the expenditure infinitely exceeded the returns.

In the Lead Hills of Scotland we learn that some 20,000*l*. were expended to obtain less than 5,000*l*. of gold. The works which have been within the last few years established in Devonshire, with a view to obtaining gold, have been relinquished with enormous loss; and those which were organized to procure gold from the quartz veins of Merionethshire are almost inactive. That gold exists in England is

no new discovery, but that it is to be found in any part of these Islands in quantities sufficiently large to pay for the labour which must be expended in obtaining it, is exceedingly problematical.

We must now pass on to the consideration of the most important of our mineral industries, and one which is immediately connected with our position amongst nations—namely, IRON.

The ores of iron are very widely disseminated, and many districts in which iron exists in great abundance remain untouched; from these we shall no doubt eventually obtain large supplies to meet the steadily increasing demands. The chief sources of the iron ores employed at present in the manufacture of iron, are the coal-fields—in which beds of argillaceous iron ore, or clay iron-stones, are found often regularly interstratified with the coals and shales. Many of the coal-producing districts do not produce iron, but if I give, in the first instance, the localities of the blast-furnaces and their numbers, and then name the sources from which each set of furnaces receive their supply of ore, the distribution of the iron trade will be clearly shown. I may here remark that, hoping to be enabled at some future time to present to the Society a complete statistical examination of the progress of the iron trade in Great Britain, I shall avoid doing more on this occasion than giving a correct view of the present extent of our pig-iron manufacture.

The exact number of iron furnaces in blast in 1855 has not yet been determined for the entire kingdom; it differs but little from the number at work in 1854, which will be found in the following table:—

Iron Furnaces in Great Britain.

County.	Number of Works.	Furnaces in Blast.	Furnaces out of Blast.	Total Built.
Northumberland and Durham	23	59	19	78
Yorkshire	14	21	7	28
Derbyshire	13	25	8	33
Cumberland	1	2	2	2
Lancashire	1	2	1	3
North Staffordshire	7	21	7	28
South Staffordshire	65	145	30	175
Shropshire	13	28	6	34
Denbighshire	7	9	2	11
Glamorganshire and Monmouthshire	48	121	48	169
Gloucestershire	4	5	2	7
Ayrshire	9	30	11	41
Lanarkshire	13	72	16	88
Fifeshire	4	9	3	12
Argyleshire	1	1	....	1
Linlithgowshire	1	3	1	4
Stirlingshire	2	3	2	5
Clackmannanshire	1	1	2	3
Dumbartonshire	1	1	1	2
Haddingtonshire	1	1	1	2
	228	559	169	728

The furnaces of Scotland are corrected for 1855.

The pig-iron furnaces of the Northumberland district were supplied from the adjoining counties, but little iron-stone being raised in these great coal-fields, a large quantity of carboniferous iron ore was sent from Scotland, and they now receive not less than 50,000 tons of hæmatite annually from Whitehaven. Within the last few years an enormous quantity of iron ore has been found in the oolitic formations of Cleveland, and, in 1854, 650,000 tons of this iron ore were consumed by the blast-furnaces on the Tyne. The hæmatite formations of Whitehaven and Ulverstone are the most remarkable in this country. This peroxide of iron occurs at Whitehaven in great vaults, and in caverns in the limestone, while at Ulverstone it is deposited, as if in pools or lakes formed in the underlying rock. Of these hæmatite ores, in 1854,

The Newcastle district took	46,785 tons.
The Birkenhead Railway received and distributed	13,380 ,,
The North-Western Railway took into Staffordshire principally	200,000 ,,
Coastwise there were sent to South Wales	150,000 ,,
The Whitehaven Hæmatite Iron Works and the charcoal furnaces at Ulverstone used	32,926 ,,
Distributed in other directions, principally coastwise	136,833 ,,

The total quantity of hæmatite iron raised annually in this district falling but little short of 600,000 tons.

The iron ores employed in the manufacture of iron in the furnaces of Yorkshire and Derbyshire are raised principally from the coal-fields of those districts. During each of the last two years not less than 700,000 tons of iron ore must have been raised in these localities.

It may appear that the enormous demands of 1855 for shot and shells would have greatly increased the quantity of ore employed. This was not the case in any remarkable degree, as nearly all the shot and shells were made from old iron collected from every part of the country.

Staffordshire, North and South, used not less than two millions and a-half tons of iron ore in each of the last two years. Much of this ore is raised in the county; but, in 1854, 213,500 tons were brought into Staffordshire from Northamptonshire, and in 1855, 74,084. Enormous deposits of an iron ore, an hydrated oxide of iron, have been discovered in Northamptonshire, and may be looked to for many years as a source of supply. Shropshire consumed, in 1854, 374,400 tons of ore, nearly all of which is raised in the district.

The Iron works of North Wales consumed about 100,000 tons, while those of South Wales appear to have required nearly two millions and a-half of iron ore for their supply. The Dean Forest furnaces used the ore raised in the forest,—85,506 tons of hæmatite ore.

Considerable quantities of spathose iron ore are sent into South Wales from Devonshire and Somersetshire, and in these counties, spread out under the new red sandstone, there appears to exist a bed, varying in thickness, but tolerably continuous, of an iron ore of fine quality. Cornwall produces hæmatite and some spathose iron.

The iron ores of the tertiary rocks are now exciting attention, and the probability is that, within a few years, the iron ores of the Eastern Counties, from which at one period nearly all the British iron was obtained, will again become as valuable as they once were.

There were formerly 10 blast furnaces in Sussex, and 4 in Kent, and there were in these counties about 9 forges. They used charcoal as a fuel, and, with the destruction of the wood, and the introduction of the use of coal in smelting iron by Mr. Dudley, in 1619, the sites of the iron industries were changed. The only charcoal iron furnaces in this country at present, are those belonging to the firm of Harrison, Ainslee, and Co., at Ulverstone, and one in Scotland. In Scotland the iron is chiefly made from the black band iron which was discovered by Mr. Mushet in 1801. The great development of the Scotch iron trade is immediately dependent on this discovery. Mr. Mushet himself remarks, after speaking of the number of iron furnaces in the course of erection,—

"This prosperous state of affairs not only abundantly enriches the iron masters who are in possession of the carboniferous ironstone, but has raised in an unprecedented manner the value of the mineral property in the neighbourhood of the furnaces. The estate of Airdrie, for instance, now returns to the proprietor for royalty, on black band discovered by me in 1801, 12,000*l.* a year; whereas, formerly, not one shilling of mineral rent was obtained."

The quantity of iron produced in all these districts, in 1854, was as follows:—

Produce of Pig Iron in 1854.

Northumberland, Durham, and Yorkshire	275,000 tons.
Cumberland and Lancashire	20,000 ,,
Yorkshire	73,444 ,,
Derbyshire	127,500 ,,
Staffordshire	847,600 ,,
Shropshire	124,800 ,,
Flintshire	32,900 ,,
South Wales	750,000 ,,
Gloucestershire	21,990 ,,
Scotland	796,604 ,,
	3,069,838 ,,

The quantities of iron made in England and Wales, and Scotland, in the following years, will serve to show the progress which has been made in our iron manufacture:—

		Tons.	Tons.
1740.	Charcoal pig iron	17,350	
1788.	Charcoal pig iron	13,100	= 61,300
	Coke pig iron	48,200	
	Charcoal and coke furnaces in Scotland		7,000
1796.	England and Wales	108,993	= 125,079
	Scotland	16,086	
1806.	Great Britain		258,206
1830.	Do.		678,417
1839.	Do.		1,248,781
1847.	Do.		1,999,608
1852.	Do.		2,701,000
1854.	Do.		3,069,838

Such is the enormous increase of our iron manufacture in little more than a century.

The average market price of pig-iron may be taken at 5*l.* per ton, which gives the total value of our manufacture of pig-iron as

15,349,190*l.* In the process of manufacture into bar-iron and steel this is greatly increased. A few of the extreme variations in the price of bar-iron will place this at once before us.

		£	s.	d.			£	s.	d.
1806	Merchant bar iron at Liverpool	17	10	0	1832	Merchant bar iron at Liverpool	5	15	0
1810	,, ,,	13	19	0	1836	,, ,,	11	15	0
1813	,, ,,	12	0	0	1840	,, ,,	7	10	0
1816	,, ,,	8	10	0	1843	,, ,,	4	15	0
1818	,, ,,	13	0	0	1845	,, ,,	10	10	0
1821	,, ,,	8	5	0	1852	,, ,,	4	15	0
1825	,, ,,	15	0	0	1854	,, ,,	11	0	0
1828	,, ,,	8	0	0	1855	,, ,,	10	0	0

I shall avoid on the present occasion anything beyond a general notice of our iron exports for the reason before stated; Mr. McCulloch's statement for 1850 may be taken as a fair representation of the general export trade even at the present time:—

"About three-tenths of the total quantity of iron is used in the state of pig or cast-iron, and is consumed principally in Great Britain and Ireland. The exports of pig-iron, however, amounted, in 1850, to about 142,000 tons, sent principally to the United States, Holland, Prussia, France, and British North America. The other seven-tenths are converted into bars, bolts, rods, &c. The export of bar-iron amounted, in 1850, to nearly 443,000 tons; and, during the same year, the exports of all sorts of iron reached the prodigious amount of 783,423 tons 5 cwt., which at 7*l.* a ton would be worth 5,483,963*l.*, and their declared value did in fact amount, in 1850, to 5,483,963*l.*"

Our exports were, in

	1853.	1854.
	Tons.	Tons.
Pig iron	333,585	293,432
Bar iron	644,886	604,662
Rod ,, ...	9,016	12,056
Cast ,, ...	60,979	69,338
Wire	9,912	7,937
Anchors, &c.	20,651	26,084
Hoops	26,199	30,709
Nails	7,970	8,141
Various sorts	111,652	111,269
Steel, unwrought	20,288	20,793
	1,245,138	1,184,421

Of hardware and cutlery there were exported, in

	Tons	cwt.		£
1853.....	32,375	5	The declared value	3,665,051
1854.....	32,054	3	,,	3,867,598

In addition to the metalliferous productions already named, there were obtained from the mines of Cornwall, Wales, Cumberland, and the Isle of Man, during 1855, not less than 5,000 tons of zinc ore in the shape of sulphuret of zinc, or black-jack; and calamine, a carbonate of oxide of zinc. The estimated value of this was at least 17,000*l.* In all probability a new era for our zinc mines is approaching, the

price for the ore is advancing, and it is now selling at prices varying from 2*l.* 10*s.* to 3*l.* per ton. The great supply of zinc for this country has hitherto been derived from the works of the Vieille Montagne Company, our imports having been as follows :—

	Zinc.	Oxide of Zinc.	
	Tons.	Tons	cwt.
1850.....	18,626	170	16
1851.....	22,986	495	9
1852.....	18,505	787	9
1853.....	23,418	342	0
1854.....	19,583	336	0

The great resources of Belgium are rapidly failing. New and economical processes for the smelting of zinc are being introduced, and we may therefore hope that the stores of zinc ore in this country, which were said in the days of Queen Elizabeth to be *inexhaustible*, and which are far from fully developed, may be turned to profitable account.

Our Islands produce antimony, nickel, cobalt, manganese, and some other metals of use in the arts. Formerly Cornwall supplied antimony to the type-founder; now I am not aware that one ton a year of antimony, produced in this country, is sold. We import all the antimony which we use. Of nickel and cobalt the St. Austle Consols in Cornwall sold last year about 150 tons, and the mines belonging to the Duke of Argyle in Scotland produced about 300 tons, averaging about 6 per cent. for nickel. Norway and Germany supply all the nickel which our white metal manufacture requires.

The sulphur ores of this country are not now used in any large quantities, the price of Sicilian sulphur being so low as to render it more profitable to the sulphuric acid and soda manufacturer to employ it than our own iron pyrites. The Irish sulphur ores, however, still find a market, and are used in the chemical-works at St. Helens. Since 1840, the production of Wicklow and Arklow has been as follows :—

	Wicklow.	Arklow.	Total.*
	Tons.	Tons.	Tons.
1840.....	27,172	13,004	40,176
1841.....	40,823	36,565	77,388
1842.....	20,494	19,963	40,457
1843.....	19,995	19,191	39,186
1844.....	15,772	19,189	34,961
1845.....	9,573	29,445	39,018
1846.....	10,815	25,245	36,060
1847.....	10,619	29,889	40,508
1848.....	15,462	25,777	41,239
1849.....	19,103	26,524	45,627
1850.....	24,221	49,823	74,044
1851.....	29,399	73,039	102,438
1852.....	30,770	67,218	97,988
1853.....	30,150	82,100	112,250
1854.....	34,000	90,000	124,000
	338,368	606,972	945,340

* Tons of 21 cwt.

Cornwall and Devonshire produce annually not less than 1,500 tons of arsenic; a considerable portion of this is employed for the purpose of giving the required whiteness to copper in our white metal manufactures, and a large quantity is exported to Russia, and other places, where it is used in dressing furs and skins. Beyond this our Salt mines produce not less than 1,000,000 tons of Salt per annum. Barytes may be obtained in large quantities. The china clays of Cornwall, the clays of Pool in Dorsetshire, and other places, form an important, but hitherto unestimated, item in our mineral produce. Beyond these our granites, slates, sandstones, and other building stones, together with the ornamental limestones of Derbyshire and Devonshire, and the serpentine of the Lizard in Cornwall—one of the most beautiful of ornamental stones, and now coming extensively into use—would swell the total value, could the quantities produced be accurately ascertained. This has not hitherto been done, but I am organizing arrangements by which I hope to arrive at the real value of our earthy minerals.

Last in the order of my plans—but the most important by far, as giving us the means of rendering our metalliferous productions available—is Coal. During last year I visited every coal-field in Great Britain, and with much labour obtained returns of far more exactness than any which had been got previously.

The collieries of the United Kingdom are distributed as follows:—

Pembrokeshire	19	Lancashire	333
Glamorganshire and Monmouthshire	227	Cheshire	30
Flintshire	30	Cumberland	23
Denbighshire	25	Durham and Northumberland	225
Anglesea	5	Lanarkshire	153
Devonshire	2	Ayrshire	78
Gloucestershire and Somersetshire	85	Fifeshire	34
Shropshire	48	Clackmannanshire	8
South Staffordshire	393	Haddingtonshire	11
North Staffordshire	123	Edinburghshire	11
Nottinghamshire	17	Linlithgowshire	15
Warwickshire	15	Stirlingshire	34
Leicestershire	11	Dumbartonshire	11
Derbyshire	123	Renfrewshire	7
Yorkshire	276	Other counties	6
		Ireland	19

Wales	306
England	1,704
Scotland	368
Ireland	19
Total	2,397 collieries in the United Kingdom.

This does not, of course, represent the *Pits*, which are far more numerous.

The annual coal produce of these Islands has been variously estimated as being 31,500,000 tons, 34,000,000 tons, and 56,550,000 tons. Between these sums numerous others have been given, all of them, however, clearly the result of guesses rather than of careful examination. With a view of determining with all the exactness possible this important question, I issued circulars to nearly all the

coal proprietors of the kingdom, I made personal inquiries over every district, and, I am bound to declare, that, as soon as the purposes of my inquiry were understood, I almost invariably was furnished with the means of making my computation with correctness. Scarcely any of the large coal proprietors refused me the information I sought. The great railway companies carrying coals, without exception, gave me, often at an enormous amount of labour to themselves, copies of their traffic returns carefully digested, so as to show me the locality from which the coal was received, and the districts over which it was distributed. The coal exported and carried coastways was easily obtainable. The greatest difficulty arose in endeavouring to estimate the quantities consumed at the collieries for the machinery and by the workmen; and again the quantities carried by carts into the neighbouring towns. By the aid of agents and viewers I was, however, enabled to approximate very closely to the truth as it regards the first, and by obtaining returns from turnpike gate-keepers and carriers, to arrive yet more nearly to the consumption of the large towns.

By these means I was able to determine that the local annual consumption of

Newcastle-on-Tyne	was about	1,400,000	tons
Sheffield	,,	600,000	,,
Leeds	,,	575,000	,,
Manchester and Salford	,,	1,850,000	,,

and similar proportions for many other large towns.

It has been estimated, which is nearly correct, that the consumption of coal in the metropolis is one ton per annum for every man, woman, and child of the population. In the large manufacturing towns the consumption is not under three tons per annum for each head of the population.

The result of my inquiries, as it respects the actual coal produce of the country in 1854, was as follows:—

Northumberland and Durham	15,420,615	tons.
Cumberland	887,000	,,
Yorkshire	7,260,500	,,
Derbyshire	2,406,696	,,
Nottinghamshire	813,474	,,
Warwickshire	255,000	,,
Leicestershire	439,000	,,
Staffordshire and Worcestershire	7,500,000	,,
Lancashire	9,080,500	,,
Cheshire	786,500	,,
Shropshire	1,080,000	,,
Gloucestershire, Somersetshire, and Devonshire	1,492,366	,,
Wales	9,643,000	,,
Scotland	7,448,000	,,
Ireland	148,750	,,
Total coal produce of the United Kingdom in 1854	64,661,401	,,

I have now given what, after a very close and attentive examination, may be regarded as the closest result yet obtained of the produce of our metalliferous mines and our coal fields. I have estimated the

actual value for 1854, as far as can be at present ascertained, of the metals and coals on the surface of the mine or at the pit's mouth, and pig-iron at the furnace, independent of any of the additions which must necessarily be made before these substances can reach the public, as follows:—

	£
Tin	559,808
Copper	1,263,739
Lead	1,400,000
Silver	147,500
Iron	9,500,000
Coal	15,000,000
Zinc	16,500
Nickel, arsenic, sulphur, and other minerals	750,000
	28,637,547

When to this our valuable clays and building and ornamental stones, are added, the immense importance of our mineral treasures becomes apparent. The above computation, it must not be forgotten, gives the value of our mining products in their simplest forms; by every step of manufacture the value is vastly increased. The production of the ores of the metals and coals, in the actual processes of mining, and preparing the ores on the surface of the mines and collieries, gives employment to 303,977 men and women. These are distributed as follows:—

	Men and Women of all Ages.
Coal	219,995
Iron	26,106
Copper	21,169
Tin	14,761
Lead	21,749
Zinc, &c.	174
	303,977

In conclusion I must venture a few words upon the commercial value of our mining operations. Mining is, and, it is to be feared, must remain for some time to come, in many respects uncertain in its results. I have, however, already indicated some *constants* in nature which may serve to guide the adventurer upon this division of human industry, and without doubt others are to be discovered by careful search.

An examination of some recent lists of the mining companies and their capitals, for a single year, shows that not less than 5,000,000*l.* sterling were subscribed, ostensibly for working the copper, tin, and lead mines of the United Kingdom. Of this sum, it appears that considerably less than 1,000,000*l.* was actually expended for the purposes of exploration, the remaining four millions being exhausted in the mysterious operations of the share market. Nothing can be more injurious to the mining interest of this country than the system of misrepresentation which so largely prevails. So long as this is persevered in, mining can only progress by a system of convulsive throbs—we shall have a year of excitement, followed by a year of depression, and individual ruin and

national loss must be the result. The moral evils extend in every direction; the want of truthfulness in the metropolis is met by a disregard of truth in the provinces; deception is met by misrepresentation. Indifference as to the real object, or what should be the real object, is generated; and, instead of carefully exploring a mine, the aim of all concerned is to advance, by any means, the price of shares, and mining becomes a game as exciting as any other gambling transaction, and similar results usually ensue.

I feel warranted in saying, after a most attentive consideration of the subject, that mining, legitimately carried out, commenced with proper judgment, guided by the advice of experienced persons, and directed with honest intentions, is as satisfactory a speculation as any in which a capitalist can engage.

In evidence of this, I may adduce an instance of the result of undeviating honesty, and ordinary caution. Upwards of fifty mining adventures were entered on—these represented a net capital of about 500,000*l.*; the mines were worked, exhausted, and abandoned. During the period between their commencement and termination these mines made a profit of upwards of 800,000*l.* I might mention several similar instances both of single mines and of groups of mines in support of my view.

The want, not merely of scientific knowledge, but of that clearness of mind, which an education, calling into action the powers of observation and of reflection, can alone produce, is evident to all who examine with care the progress of mining.

Errors are continually forcing themselves upon attention; errors in surveying, and in mapping what has been surveyed; errors in engineering, producing a great waste of mechanical power, and often a needless outlay of capital; and errors arising from a want of even a rudimentary knowledge of mineralogy and of metallurgical chemistry. I could give special examples of each of these sets of errors if it were desirable to do so.

An habitual carelessness, too, marks many of our operations. When passing over our coal-fields we see naked boilers exposed to winds, rains, frosts and snows; burning piles, and ash-spread wastes, mark the way to a colliery; desolation reigns supreme in a robe of smoke on her throne of fire.

The drain at present upon our coal-fields is infinitely greater than it has been at any previous period; and, it should be remembered, that the coal-fields of Great Britain are not inexhaustible—the age of coal formation is gone by.

Surely, when we consider the great value of our mineral productions, the immense amount of engineering skill which is called into operation by the processes of mining, the extension of all our metallurgical operations, and hence the increasing demand upon the earth for supplies of the raw material, the difficulties of obtaining which are constantly increasing with the depth of our mines, and the vast amount of labour which mining and metallurgy creates, it will be evident to all that a legitimate system should be pursued if possible, and a sound practical knowledge steadily enforced. The almost entire ignorance of the great mass of the public, on all subjects connected with our mineral produce, lays them open to be deceived

by the representations of the pretender. The extension of knowledge in this direction, may therefore aid considerably in improving the character of mining speculations.

It is no trifling matter to be coolly passed by; the drain upon Nature's stores is now going on at an enormous rate. We are as stewards in charge of this vast property, and when we reflect that England's position in the commercial scale of nations is dependent upon her judiciously employing the vast treasures which are spread through her sea-girdled rocks—upon the skill with which she directs her native industry—upon the powers of mind which are brought to bear upon the search for mineral treasures, and upon the methods for rendering them available when found, it cannot but be evident to all that an education combining scientific knowledge, and the powers for applying that knowledge, is the great want of the day.

We should remember, too, that though our forefathers left us a rich inheritance, our children's children may have to reflect upon their injudicious grandsires. The past becomes the instructor of the present in its duty to the unknown future. The storehouse of wealth, upon which we draw so largely, should be guarded—as Merlin protected the fabled treasures of the Cambrian hills,—by the constant watch of sleepless eyes, rendered more penetrating by the touch of the prophet's wand of science.

(*Note.*—In the interval which has passed between the reading and the publication of this Paper, the "Mineral Returns" for 1855 have been obtained and published.—R. H.)

On the Financial Statistics of British Government Life Annuities (1808-1855), *and on the Loss sustained by Government in granting Annuities.*

By Frederick Hendriks, Esq.

[Read before the Statistical Society, on Monday the 19th of May, 1856.]

In submitting this paper to the *Statistical Society*, it is proposed to arrange the subjects for discussion in the following order:—

I.—Introductory.—*System of Life Annuity and Tontine Loans in the period antecedent to* 1808.

II.—Government Life Annuity Plan, *introduced in* 1808 *by the Right Honourable* Spencer Perceval.

III.—Progress and Amendments *of the Government Life Annuity Plan, from* 1808 *to* 1829.—Deposit Scheme.—Deferred Annuity Scheme.—Dead Weight Annuity.

IV.—Financial Statistics and Results *of Government Life Annuities granted during the First Period. (September,* 1808, *to January,* 1829.)

V.—*Select Committee of the House of Commons on Public Income and Expenditure, (4th Report of* 1828.)—Sinking Fund.

VI.—Government Life Annuity Plan, *introduced in* 1829 *by the Right Honourable* Henry Goulburn. *With note upon the projected Government* Life Insurance Plan *in connection with Life Annuities, and upon* Deferred Annuities *to Savings' Banks Depositors.*

VII.—Financial Statistics and Results *of Government Life Annuities granted during the combined Second Period, September,* 1808, *to January,* 1829, *and January,* 1829, *to March,* 1855, *with observations on the prejudicial effect of the grant of Government Annuities as a National Measure for redeeming Debt.*

VIII.—Abstracts *Nos.* I. to IV., *with* Appendix of Tables.

I. Introductory.—*System of Life Annuity and Tontine Loans in the period antecedent to* 1808.

The system under which Life Annuities are granted by the government, has been restricted, during the last half century, to the exchange of such annuities for a consideration, in stock or money, applied to the reduction of the National Debt in the manner of a sinking fund.

The older plan, under which the government raised *new loans* by the grant of life annuities, has deservedly fallen into disuse. The plan in question was inaugurated, in this country, by the loan raised under the Act of the fifth of William and Mary (1693, N.S.), which Act charged upon the security of a certain portion of the Excise duty, annuities granted for one, two, and three lives. The terms were 14 per cent., or $7\frac{1}{7}$ years purchase, for one life at any age; 12 per cent., or $8\frac{1}{2}$ years purchase, for two lives; and 10 per cent. for three lives. Extravagant as these terms may appear, when viewed, as has been done by some writers, in comparison with the then legal rate of interest—6 per cent.,—or with the worth of an annuity according to the presumed expectation of life at that time, and assuming the most favourable ages to have been chosen; they cease so to appear, upon reflection that life incomes under the guarantee of the government of the Revolution, the stability of which was doubted, offered no particular inducement to the capitalist. The

best financial proof of this is, that the government was paying nearly 40 per cent. more than the statutory rate of interest for the money they had to borrow on perpetual annuity; and the calculation of the terms for life annuities was, doubtless, based on no other than a rough estimate that 10 per cent. having previously been, almost from time immemorial, a usual rate of single life annuity granted by corporations, or by individuals, in this country, for money sunk at any age, it followed that the rate in question should likewise be increased 40 per cent., thus making the government rate 14 per cent.

If lower terms had been offered, the finance minister of the day would have had nearly a blank subscription list, and even as it was, the operation met with no favour, and supplementary regulations were adopted, giving subscribers the option of converting their life interests into annuities for long terms of years.

As to any impression that may exist of a more precise estimate of a variable rate of annuity, according to age, having been available at the time, it should be noticed that the science of vital statistics was then only on the eve of development;—and, without entering further into the history of this early experiment by the British Government of the practicability of creating new funds by the grant of life annuities, and without enlarging on the somewhat obvious reasons for the comparative failure of it, and of similar measures of finance generally, it is only needful, before passing to the more specific subject of the present paper, to observe that some loans of small amounts were subsequently obtained by different life annuity schemes under Acts passed in the reigns of Anne, George II., and down to the 19th year of George III., which charged the payments of interest upon various branches of Excise and Customs Duties, and in some instances upon the Sinking Fund. The terms in the reign of Queen Anne were 9 years purchase for an annuity on one life, 11 years purchase on two lives, and 12 years purchase on three lives. Some of the fundings under these Acts were in tontine annuities, but the results were found to be fraught with social evils which led to their final suppression, and to their sharing in this respect the fate of the lottery system.

The proved impracticability of raising any large amount of funds on equitable and at the same time advantageous terms, upon, relatively speaking, so unmarketable a security as a life annuity, the impossibility of carrying out such an operation to any very considerable extent, and within a limited period of time, are circumstances which, apart from several other objections which may fairly be made to such a plan of finance, render it unlikely that the experiment will be renewed.

II.—Government Life Annuity Plan, *introduced in* 1808, *by the Right Honourable Spencer Perceval.*

Thus far reference has been made to the plans having for their object the creation of new funds, or of new debt, by the grant of life annuities on government security; but other considerations are involved when examination is made of the modern system, which is assumed to have the power of cancelling old funds,

or old debt, by the identical means which acted in the reverse way under the former mode of operation.

This change was brought about as follows: — The principles of Mr. Pitt's sinking fund, established in 1786—(and practically defined under the Acts of Parliament 26 George III., c. 31; 32 George III., c. 55; and 42 George III., c. 71),—were in full vigour and favour, and Lord Henry Petty's financial plans had also been brought into notice, when, in May, 1808, and during the Portland administration, the Chancellor of the Exchequer, Mr. Spencer Perceval, proposed to the House of Commons a series of resolutions with the view of enabling persons possessing stock in the 3 per cents. to transfer that stock to the Commissioners for the Reduction of the National Debt, for the purpose of obtaining in its stead *equivalent* annuities for life, amounting to such a sum over and above the dividend on the stock, as an accurate calculation of the value of the principal so transferred would prescribe; taking the stock at the current price of the day of transfer, and varying the calculation according to the age of the individual.

The limits to this privilege were, that no single-life annuity should exceed 1000*l.*, nor annuity on two lives 1,500*l.*—that the power of transfer should not be allowed to persons aged under 35 years—that less sums than 100*l.* should not be commuted—and that all the lives who were nominees of the purchasers should be natives of, and resident in, the United Kingdom.

Mr. Perceval's statements show that the following advantages were expected to result from the measure:—

1st. "*The removal from the market of all such stock as would become subject to the proposed commutation.*"

As the amount of stock likely to be commuted was, of course, quite unknown, this argument might, or might not, turn out to be of importance, and although it was put in the front rank of Mr. Perceval's statement, its eventual effect in influencing the price of the funds could only be taken as experimental.

2ndly. "*That the effect of the measure would be to secure to the nation the redemption of the funds so transferred, at the price at which they were when the transfer was made.*"

Upon the truth, or, contrariwise, upon the fallaciousness of this assertion, the whole question of the good, or ill, which was to flow from the measure, manifestly turns; and that is the chief question which it is proposed to test in the course of the present paper.

3rdly. Mr. Perceval in introducing his plan, made the following important observations:—

"The Committee must be perfectly aware that the operation of the sinking fund has recently very much increased the price of stocks. There is every reason to believe that by the continuance of that operation they will still further be increased in price. No one can doubt, Sir, that if the measure were consistent with public faith, it would be extremely desirable to give to the nation an opportunity of redeeming the whole of the national debt at the present price of the stocks, because that would preclude the effect which any future advance in the price of the stocks must have in retarding the operation of the sinking fund. There are two objects which the sinking fund has in view, the one to provide for the final redemption of the national debt, the other to keep up the price of stocks in the market, so as to

enable Government, whenever the exigencies of the state may require it, to make an advantageous loan for the public. These objects, however, Sir, are in some degree inconsistent. In some degree they counteract each other. Whatever measure raises the funds, and thus enables Government to borrow on the best terms, prevents the Commissioners for the Reduction of the National Debt from reducing that debt on the best terms. Now, Sir, the measure which I propose will combine both these objects; it will naturally tend to increase the price of stocks, and it will, at the same time, secure the redemption, at a low price, of so much stock as may be transferred antecedent to the rise produced."

Mr. Perceval expressed himself, to say the least, very unadvisedly, when he thus spoke of the desirableness of giving the nation an opportunity of redeeming the *whole debt*, then about 586,000,000*l*., by commuting it into life annuities! A more heterodox financial doctrine from a minister of finance could scarcely be broached.

Passing to other points, it will be observed how closely the life annuity plan was mixed up with the sinking fund—how, in fact, it was made to form only an ancillary portion of it. Apart from the questionable view as to forcing up the price of the funds, the government of 1808 averred, that the object of the plan was not to obtain for the public any profit from the sale of annuities, but solely to secure the redemption of the stock transferred, at the price which it may bear at the time of the transfer. The way whereby this was to be effected is clearly defined in the following passage in Mr. Perceval's speech:—

"Every person who transfers his stock to the Commissioners will be entitled to such an annuity as will be equivalent to the value of the stock and of his life; the calculation proceeding on the principle that the sum which he would otherwise have received as interest, the additional sum granted as an annuity, and the compound interest on the whole, would redeem the sum originally transferred within the period to which the individual's life will be calculated as likely to extend. For instance, if a person were disposed to transfer to the Commissioners 1,000*l*. of 3 per cents, and upon the estimate of the probable duration of his life, and of the compound interest, it should be calculated that he was entitled for that transfer to receive twice the amount of his former interest, he would then have a right to an annuity for life of 6 per cent., or 60*l*. on the whole sum; the calculation proceeding on the principle, that the accumulation of the additional 30*l*. would, at the probable close of that person's life, be equivalent to the redemption of the stock originally transferred, and that at the price at which it was originally transferred."

Whilst the Chancellor of the Exchequer thus appeared to generalize the principle, he was really only looking to one side of its working, and was taking for granted that which was the radical error of the sinking fund principle, viz.—that the state could realize compound interest on money borrowed, and levied by taxation. True, the reasoning upon the premises laid down, was correct so far as concerned the life annuitant's side of the question, always provided he could reimburse the redemption fund portion of his annuity at the rate of interest which governed the transfer; but how was it on the other side of the question, viz.—on the side of the community at large, the payers of taxes, the government? The effect here was, that portions of capital had to be furnished out of taxation as well as instalments of interest, and, taking the example quoted by Mr. Perceval, the additional annuity of 30*l*. had to be provided during the lifetime of the annuitant,—in other words it had either to be borrowed from year to year at rates of interest on perpetual stock

freshly created, which might be higher than the rate at the time of the original transfer of the stock into the life annuity, or else it had to be raised by taxation within the year, and from year to year, at times when money saved to the tax-paying public was worth much more than the nominal rate indicated by the price of the funds.

The operation, as exemplified in the instance quoted by Mr. Perceval, is worth following out in closer detail. Under the Government plan the sum of 1,000*l.* 3 per cent. stock (the sum mentioned in Mr. Perceval's example) was transferred to the credit of the Commissioners for the reduction of the National Debt, on account of the sinking fund, and the payment of the income derived from it, namely, 30*l.*, *plus* the 30*l.* per annum to make up the life annuity of 60*l.*, was charged upon the sinking fund. The effect of this was, that the sinking fund forthwith became 30*l.* per annum poorer during the annuitant's lifetime than it would have been had the annuity not been granted, and consequently the expenditure of the country on account of the sinking fund was increased in that proportion.

At the age of 50, the price of 3 per cents being 68, which was the price at the date of Mr. Perceval's measure, 1,000*l.* stock, or 680*l.* money, would have produced just the life annuity of 60*l.*, as in the example, being at the per centage of 6*l.* for stock, or 8*l.* 16*s.* 6*d.* for money. The ruling rate of interest in the transaction is obviously 4*l.* 8*s.* 3*d.* per cent., and the 60*l.* per annum is, on such a basis, sufficient to provide—1st, 30*l.* per annum, or 4*l.* 8*s.* 3*d.* per cent. on the purchase money considered as equal to 680*l.*; and 2ndly, an additional 30*l.* per annum, which, accumulated at 4*l.* 8*s.* 3*d.* per cent. interest, would amount at the annuitant's death to the sum of 680*l.*—*i. e.*, would suffice to redeem the purchase money. The question is, whether the public did not lose more than 4*l.* 8*s.* 3*d.* per cent. by the imposition of the taxes necessary to meet the additional charge of the 30*l.* per annum during the lifetime of the person aged 50?

If there were no error in the table, and the life survived his expectation, and no longer, and if the price of the funds at his death were not lower than at the date of the transfer, and if the value of money left in the hands of the public to be employed productively in industrial occupations of every kind did not exceed the rate of interest (4*l.* 8*s.* 3*d.*) involved in the particular transaction, then, neither profit nor loss could result. But all such conditions were made matter of speculation; and, in the long run, they have generally told in a manner detrimental to the public advantage, and it will be the object of the present paper to endeavour to ascertain how far this is substantiated by such statistics as are available for the purpose of the enquiry.

The life annuity being regulated by, and fluctuating with, the varying price of the funded 3 per cent. debt, it follows that the higher the price of the 3 per cents. the higher is the annuity granted for the transfer of a given amount of stock, and in proportionate gradation does the risk of loss from a fall in the market price of stock, and an increase in the value of money to the public, augment. It deserves notice that Mr. Perceval, in introducing the life annuity plan, used some candid—(or, rather, ingenuous)—expressions on this

head which point to a fact that has been too much neglected since his time. Addressing the Chairman of the Committee, he said:—

"*The whole merit, therefore, Sir, of this plan rests on the accuracy of the expectation that the stocks are likely to rise. I am ready to admit, that if the contrary should take place, the measure will have a tendency directly opposite to that which I expect.*"

These words are sufficient proof that the scheme was looked upon originally, as being what in truth it really was, and is—purely and simply a speculation.

The resolutions were agreed to, and on the 2nd of July, 1808, the Act of 48 Geo. III., c. 142, was passed for enabling the Commissioners for the Reduction of the National Debt to grant life annuities. On comparison of the Act with the resolutions, it will be seen, that the wording of the resolutions is retained, with the exception of the words that referred to the material accomodation and convenience to the public, which would result from the measure. An expression which is rather more problematical is prominently put forward, viz.—that it "would tend to a more speedy and efficient reduction of the national debt." *Query—has the teaching of results tended to prove this preamble?*

Table A of the Appendix to this paper contains, in columns 6 to 13, a condensed abstract of specimens of the annuity rates for single lives at ages 35, 40, &c., to 75, and at different prices of the funds, from 60 to 80, as provided by the Act. The terms of this statute made no provision for the grant of annuities when the price of the 3 per cents should fall under 60, or rise above 81.

III.—Progress *and* Amendments *of the Government Life Annuity Plan, from* 1808 *to* 1829.—Deferred Annuity Scheme.—Deposit Scheme.—Dead Weight Annuity.

In the following year (1809) an amending Act, 49 Geo. III., c. 64, was passed, by the first clause of which power is given to grant an annuity of 3,000*l.* upon any one or any two lives.

In 1812 a further amending Act, (52 Geo. III., c. 129,) was passed, in the first clause of which is mentioned the expediency of provision being made for granting life annuities whenever the average price of the consolidated and reduced annuities shall be under 60 or above 81.

In columns 2 to 5 of Table A, in the *Appendix* to the present paper, specimens are given of the rates of prices of stock under 60; and columns 12 and 13 contain the rates at the price of 80 to 81. With regard to the power to grant annuities at prices of stock above 81, this statute provided that the rates applicable to the price of 81 should rule at all prices above, so that the rate of annuity at that price became the *maximum*.

It deserves notice that in the following important respects—1st, a *minimum* age for purchase of 35; 2nd, a *maximum* rate of annuity at age of 75; 3rd, a *maximum* of the sliding scale at price of 81 per cent. for stock; and 4th, restrictions as to the amount of annuity on any one life—limitations were introduced having a most material effect in diminishing the loss accruing from the errors in the Table of Mortality on which the calculations were based.

The basis of the tables under the Acts which have been referred to, was Dr. Price's estimate of the duration of life, called the Northampton Table, to the net rendering of which a small per centage was added, averaging about 2 per cent. There can be no doubt that the adoption of such a table was ill advised, as it was not unknown to men of science at the time that there were, then extant, Tables of Mortality, which gave a truer view of the duration of life in select classes of the community. *De Parcieux's* Table of the Mortality amongst Annuitants was, for example, an extremely appropriate scale which might have been safely adopted, and which was, and still is, practically used on the continent of Europe as the basis of such calculations.*

As De Parcieux's table does not deviate, as regards the results at ages from 30 to 70, in any important degree from the rate of mortality according to other recognized relatively true standards of the kind, even at the present day, it is instructive to check the old British Government Life Annuity Rates under the Acts which have been so far alluded to, by comparative estimates upon the table of De Parcieux at various corresponding ages and rates of interest.

Table B of the Appendix is consequently submitted, containing 45 calculations of the rates of profit and loss upon the Government scale, reduced to their worth as in ready money at the outset of each transaction, and it indicates, with considerable accuracy, the fair limits of the extent to which the Government scale deviated from the more correct standard. It proves that very little loss was likely to arise from annuities granted by the Government on lives in advancing years of age; in fact, shortly after the age of 65, and at the more advanced ages of 70 to 75 and upwards—(at which, *i. e.* at age of 75, the annuity rate attained its maximum),—there was even a profit to be reasonably expected.

The errors of the table, against the Government and the taxed

* When Mr. Pitt, in 1789, introduced, as Chancellor of the Exchequer, his measure for raising the Tontine Loan of that year, of one million sterling, he stated to the House of Commons that the calculations had been made on the "*most approved Tables of Lives.*" From the evidence of the original MS. calculations and outline of the scheme (formerly in the possession of Mr. Pitt's secretary and now in that of the writer), it may be seen that the approved tables referred to by Mr. Pitt were those of *Kerseboom* on the Mortality of the State Annuitants in Holland. They did not differ very materially from those of *De Parcieux* on French Annuity Nominees. Mr. Baron Maseres, in his well-known work (London, 1782), had pointed out the near general correspondence of the two tables, the applicability of either of them, if Government should determine to grant life annuities either in the case of new loans, or in discharge of a part of old loans in perpetual 3 per cents. This learned and spirited patron of science also pointed out the grounds of his preference for *De Parcieux's* Tables of Mortality, and published his own elaborate and laboriously calculated Annuity Tables deduced from them.

Space only admits of our briefly noticing that, as a matter of calculation, in the particular instance of the Tontine Annuity of 1789, *with benefit of Survivorship,* it was scarcely of any consequence whether the table of *Kerseboom,* of *De Parcieux,* or of *Dr. Price* on the Northampton Mortality, had indifferently been used. But with life annuity plans *without* benefit of survivorship, the discrimination between the tables became of great importance, and it is remarkable that upon the Government of 1808 adopting their Life Annuity scheme, the table which out of the three was the worst adapted to the purpose should have been chosen, although, as just above indicated, the Government, or at least Mr. Pitt, was better informed so far back as 1789.

public, and in favour of the annuitant who became a charge upon them, were thus in the inverse proportion to the age of the nominee; in other words, the *younger* the annuitant the greater the loss. It is of some importance to keep this in mind, as it is a commonly received opinion, that the contrary rule prevailed, and that the *older* the life the greater was the loss.*

In all cases affecting the political economy of the nation, it is earnestly to be desired that whilst we avoid, on the one hand, a system of minute and, so to speak, microscopical statistics upon subjects of no general importance, we do not, on the other hand, lose sight of the necessity of having all the facts essential for the investigation of great questions systematically and fully before the public, whom it concerns. This full measure of information has never yet been so submitted either as regards Life Annuity statistics or upon the, in many respects, analogous subject of Terminable Annuities for years certain. The importance of the questions which arise out of these branches of financial administration is obvious from the constant evidence of discussions, in and out of Parliament, upon the relative equity of letting remoter posterity bear its share of the burdens of debt, or of throwing the greater, if not the whole, share on the present generation.

In the matter of Annuities for Terms of Years Certain,—the grant of which has, during the last 31 years (1824 to 1855), formed a financial operation of such magnitude, that, to the date of the last returns, no less than nearly 20,000,000*l.* of capital stock representing perpetual annuities had been cancelled, and terminable annuities issued in their stead, of which latter 864,000*l.* per annum were outstanding at 31st March, 1855, and with power of augmentation, of course, continuously running on—no statistics, nevertheless, are before the public either of the dates to which, or terms for which, these annuities have been granted. Similarly with Life Annuities, no returns of ages at which granted, number of lives and amounts of annuities depending at each age, deaths at each age, or of actual payments in each year stated separately from terminable annuities not dependent on life.

It cannot properly be urged that these are points either remote from the object, or inconsistent with the scope, of the Finance Returns of the United Kingdom. If these returns are to include for the future such minute items as they have done almost from a time beyond the recollection of the oldest financier,†—if, for example, they are to continue to specify such items as 10*s.* conscience-money from Ireland, 1*l.* for fees of such or such an office, 40*l.* for the repairs of King Charles's statue, &c., &c., which appear in the latest accounts,—if, when occasion has required it at various periods in our

* For instance, Mr. McCulloch, in his Treatise on Taxation, uses these words:—"At the outset Government lost very large sums by this project from their granting annuities on advanced lives at too low rates."

† The late Mr. Marshall in his "Statistical Display of the United Kingdom," published in 1832, gave some curious instances of the "affectation of precision in balancing to a farthing." He remarked upon such an item appearing in the printed accounts as the following, "Imprested from the Earl of Liverpool, on account of Secret Service Money, *Sixpence.*"

financial history, numberless folio pages of finance statements have been devoted to the reconcilement of some trifling fractional difference, moderate space in the printed official returns would be well directed to the classified statistics of Life and Terminable annuities, which together constituted at 31st March, 1855, nearly one-thirteenth part of the whole charge on the Consolidated Fund for interest on the national debt. This proportion is *exclusive* of Long Annuities, Dead Weight Annuity, and Tontine Annuities, which are distinguished in the accounts.

Before referring to the collective results of the various statistical tables and to the calculations based thereon, which have been made in illustration of the present paper, it will be well to complete the narrative of the annuity plan down to the period when it was put on its present footing.

In 1816, an Act (56 Geo. III., c. 53) was passed, which empowered the Commissioners to accept transfers of long annuities instead of 3 per cents as the consideration for life annuities. The principle of this statute is by no means obvious, as the conversion of long annuities into life annuities must, in many cases, have been a prolongation, instead of a curtailment, of the period of the original term of the annuity. And even although this remark did not apply to the full extent at the date of the Act, it was, nevertheless, a condition of increasing applicability as, in the course of time, the Long Annuities approached nearer to the date when they will expire (1860).

In the following year, 1817, another Act of Parliament was passed (57 Geo. III., c. 26), which enabled 4 and 5 per cent. stocks to be commuted, and introduced the following further important modifications of the four preceding Acts.

1st. The grant of annuities was extended to the lives of nominees of the age of 21 to 35.

2nd. Money was allowed to be accepted by the Commissioners in lieu of 3, 4, or 5 per cent. stock, or of Long Annuities. The Act does not, however, appear to prescribe to the Commissioners any particular course, with regard to the immediate application of the money; so that the amount received became subject to their own discretion, as to subsequent investment, at the loss or gain which even a few days' delay might give rise to. It cannot be gathered from the finance accounts what proportion the sums paid in money bore to the stock transferred, prior to the year 1830, but from and after that date the sums are stated, and from the date 1830 to 1855 a table of the appendix has been constructed, but as it belongs, in point of date, to a subsequent section of this paper, it is merely mentioned here in passing.

3rd. The Commissioners were empowered to grant DEFERRED ANNUITIES. The returns of these grants do not appear in the finance returns, but their annual average amount must have been but a small sum, for, in 1828, nearly 11 years after the date of the Act, the annuities of this class outstanding were only about 13,000*l.*

4th. The Commissioners were empowered (under Clause V. of the Act) to grant additional annuities to persons who had already purchased life annuities, and the spirit of this enactment was doubtless to do away with the limit of 3,000*l.* per annum, as the maximum amount of annuity, and to extend it indefinitely.

5th. An operation of a peculiar financial nature was provided for by another clause (No. VI.), which erected a GOVERNMENT DEPOSIT AND ACCUMULATION OFFICE, the Commissioners being authorised to accept stock, or money, at any time, and to invest it so as to produce compound interest, by investments in 3 per cents. In compensation for the trouble of trusteeship thus to be exercised by the Commissioners, the transferrers were required, at the time of their first paying stock or money, to enter into an agreement, that, at the end of a fixed period of time, such period to be chosen by the transferrers, the whole amount of the accumulations should then be turned into an annuity, immediate or deferred, upon the life named at the date of the contract. The whole of the scheme under this clause deserves no better a designation than a time-bargain stock speculation, in which the Government held the stakes, and those who parted with them surrendered that power of volition, in respect of the disposal of their own property, which they would have retained had they not entered into the contract. The limitating clause (No. VII.) of the Act would, however, have operated thus: Take, as an example, an individual aged 50 going to the National Debt Office and, under Clause VI. of the Act, entering into an agreement to purchase an annuity out of the accumulation of his payments, at the end of 10 years. Say he paid the Commissioners 1000*l.* per annum, and that they invested it for him at such average prices of the 3 per cents as realised him 4 per cent. compound interest. The result would be, that on the day before he attained the age of 60, his accumulations would just amount to 16,000*l.* stock. If he died on the day in question, Clause VII. provided that the whole amount of accumulations (in this case the 16,000*l.*) should be paid to his representatives, but if he lived a day longer and attained the age of 60 he had nothing to fall back upon except Clause VI, under which, whatever might be his state of health, even if the physician should pronounce his life not worth ten minutes' purchase, the 16,000*l.* claim would disappear and his representatives only be entitled to claim a quarter's annuity, under the general conditions of the Life Annuity Acts. Whether any or many customers were secured under these provisions of the Act, does not appear, but, as a specimen of a financial vagary assuming the appearance of a provident scheme it has scarcely a parallel.

In the year 1822, as if with the view of undoing, on the one hand, what they were accomplishing on the other, and whilst the life annuity plan was *condensing* and altering taxation and loans, from the charge to meet annuities on capital stocks into the charge to meet larger annuities for shorter periods of time, the Government *at the same moment* devised a scheme to *expand* and alter taxation and loans, from the charge to meet annuities to lives into the charge to meet smaller annuities for longer periods of time than the lives were likely to endure.

Thence arose the scheme under which the country borrowed a fresh sum to extinguish an old debt, in the transaction known by the name of the DEAD WEIGHT ANNUITY, 585,740*l.* of which was sold to the Bank of England for about 13,089,000*l.* This transaction and its sinking-fund fallacies were emphatically condemned by the Select Committee on Public Income and Expenditure, which sat in the year

1828. The remarks, in pages 22 and 23 of their fourth report, are very instructive on this point, but it is somewhat surprising that the Committee did not more closely investigate the principles of the general Government life annuity scheme, so as to add further consistency to their conclusion upon the principle of the dead weight annuity, in which they remark that it does not appear that there is any objection to the principle of diminishing the immediate weight of a public burden, existing in the shape of life annuities, by converting it into an annuity for a longer term than the average duration of the lives for which it would be payable, and thereby diffusing the charge at a diminished rate for each year, over a longer space of time.

No further legislation took place in life annuity matters until 1828. In the meanwhile the public transferred their stock and paid money to the extent shown in Table D of the Appendix to this paper, which affords a very fully detailed estimate of the capital stock of every denomination transferred and cancelled in each year, with a separate statement for long annuities cancelled. Table H of the Appendix is an account of the amount of annuity granted in each year, the amount of annuity expired in each year, and the balance charge outstanding. (*Vide also Abstracts Nos.* I. *and* II., *immediately preceding the Tables.*)

Interpellations seem from time to time to have been addressed to the Government, on the subject of the rates of annuity being calculated upon terms too favourable to the life-annuitant, and more than one petition was laid on the table of the House of Commons setting forth that such was the case.

The calculation of new tables of mortality, to be estimated upon the recorded results of annuity and tontine transactions entered upon by the British Government, were ordered to be made by the department of the Commissioners for the Reduction of the National Debt, and, after several years' labour, the results were published, by order of the House of Commons, 31st March, 1829. The great feature of the new table, called the Government Observations, was that it made a wider degree of difference between male and female expectation of life than had been observed in other previous investigations into the relative vitality of the two sexes. So far as regards male life the results, for all practical purposes, were closely identical with those of *De Parcieux's* Table at nearly every age, but there is room left for doubt whether too short an assumed duration of life for males, particularly at advanced ages and in a select class, and, consequently, too high a rate of annuity at such ages, is not still allowed to regulate the terms on which the Government grants life annuities.

To revert, however, to the chronological order of our enquiry. The reader need scarcely be reminded that, between 1824 and 1829, the great question of public revenue, expenditure, and debt was much discussed, and important alterations effected. The empiric system of the sinking-fund theory, which had been believed in with varying degrees of credulousness for some 112 years, and which had withstood the heavy blows dealt at it through the remarkable work of Dr. Hamilton, was at length beginning to totter on its foundation. The subject of life annuities formed a component part of the general questions under discussion, in connection with the labours of the

select committees on public income and expenditure, which sat between 1825 and 1829. Convinced of the loss which had accrued under the tables hitherto in use, and pending the completion of the new tables and the then forthcoming general recommendations of the Select Committee of the House of Commons on the Public Income and Expenditure of the United Kingdom, an Act of 9 May, 1828 (9 George IV., c. 16), was passed, to repeal so much of the several Acts as empowered the Commissioners for the Reduction of the National Debt to grant Life Annuities.*

This suspense period of the scheme is a convenient stage at which to consider how far its principles were, or were not, altered to meet the changed conditions of the times, and to place it on a level with the information obtained through the experience of the past.

The plan which the Government seem to have pursued was not the test of general principles of finance and taxation, but was restricted to the examination of the vital statistics of the nominees of the English and Irish Annuity and Tontine schemes.

This amounted to little beyond a laborious means of corroborating, so far as new facts were suitable to elucidate that view, the recognized fact that the duration of life amongst a select class, such as annuity nominees, is usually superior to the duration of life at like ages amongst the unselected or general mass of the community.

The Government did no more than direct a new table to be constructed; and there is no trace discoverable of their having enquired whether the principles on which the life annuity scheme had been originated in Mr. Perceval's time, and particularly the theory as to the then assumed power of the scheme to redeem the stock transferred at the price of the original commutation of the perpetual annuities into increased annuities ceasing at the expiration of the selected lives, were realized, or not, in the practice of the transactions which had taken place.

The life annuity plan was manifestly part and parcel of the Sinking Fund plan, appeared in strict conjunction with the accounts of that fund, and should have stood or fallen with it. If calculations of the results of that fund showed, most unmistakably, its costly failure, the fallaciousness of its theory as well as of its practice, the results of the petty sinking fund of life and terminable annuities might with propriety have been subjected to the same tests of enquiry, and to the same methods of remedy. In some respects, indeed, the life annuity plan, as an offshoot of the sinking fund, presented defects from which the body of that fund was comparatively free. The latter fund was in general of definite and prescribed

* The impelling motive of this repealing Act was the Report of the Select Committee on the 10th March, 1828, couched in the following terms :—

"The Committee having, in the course of their inquiries, discovered that the conditions under which the Commissioners of the Sinking Fund are required, by the Act for enabling the Commissioners for the Reduction of the National Debt to grant Life Annuities, are extremely disadvantageous to the public, feel it to be their duty to call the immediate attention of the House to the expediency of repealing this Act."

Vide also Mr. Alderman Waithman's statements in the House of Commons on the 24th April, 1828, (Hansard, vol. xix., p. 50,) and Mr. Finlaison's Evidence on the 29th March, 1849, annexed to Report of the Episcopal and Capitular Estates Commission.

extent, and the measure of its obligatory character was matter of public arrangement. Not so as regarded the extent of the operation of the life annuity plan, as it conferred an inchoate right upon every stockholder, and an available power upon every possessor of money, to exercise his own pleasure in burdening the country with further taxes, and with further loans, to provide him with the additional charge resulting from the grant of the life annuity he chose to purchase. In other words, each transaction so entered upon at the choice of the fundholder, and not at that of the public, imposed upon the latter the creation of a sinking fund, beyond the original or legitimate charge under the perpetual annuity on the capital stock which was commuted upon the purchase of a life annuity.

We ought to be very disinclined to accept any dictum, however distinguished the authority from which it may proceed, that the loss under the old life annuity scheme, from 1808 to 1829, arose purely and simply out of the errors of the table of mortality. It is an error to assume that the whole matter for investigation is the actual, as compared with the expected, degree of vitality of the annuitants; and it begs the question that nothing attaches to the after effect of the rate of interest originally regulating the annuity transaction, and consequently that the subsequent prices of stock and rate of interest, and the incidence upon the taxed public of the altered fiscal and financial regulations accruing from each grant of a life annuity, have nothing whatever to do with the ultimate result!

We must either concede this, or else examine how far the question is resolved, affirmatively or negatively, by the financial statistics of the life annuity plan, so far as they can be sifted from the public accounts.

With the view last-mentioned, it will be desirable to divide the enquiry into two distinct periods. The *first period* extending from 1st September, 1808, to the 5th January, 1829, being the term during which the old life annuity plan, introduced in the chancellorship of Mr. Perceval, was in operation. The *second period* extending from 1st September, 1808, to 31st March, 1855, being the whole period down to the last date of the finance accounts, during which the old life annuity plan just referred to, and the new life annuity plan introduced in the chancellorship of Mr. Goulburn, have been in operation.

Strictly, there should be three branches of enquiry, viz.—the first two to comprise the investigation of the results of the old plan during the two periods *separately*, and the third branch to take cognizance of the new plan separately from the old. There are, however, statutory impediments which render this sub-division impossible. It would be getting out of the chronological order of this paper to enter into explanations at this point of the enquiry; they will therefore be submitted in a subsequent part of it, and we will therefore proceed at once to consider the financial statistics of the life annuity plan during the first period commencing 1808, and ending with the close of the year 1828, taking the general point of view at the period of the financial accounts for the year ended 5th January, 1829.

As conducive to clearness and to economy of space the various statistical tables illustrative of both the periods are transferred to the Appendix; and it is hoped that the precise definitions endeavoured to be conveyed in the headings of those tables, will afford some assistance in the course of the following observations on the aggregate results, and on the general deductions, which may be drawn therefrom.

IV.—Financial Statistics *and* Results *of Government Life Annuities granted during the First Period, September,* 1808, *to January,* 1829.

(*a*). The collective results of Table D show that the amount of capital stock of various denominations transferred to, and cancelled by the Commissioners for the Reduction of the National Debt on account of life annuities granted between the years 1808—1829, was nearly 10,919,000*l.*, and that, in addition, a total long annuity of about 24,000*l.* (expiring in 1860, had it not been transferred) was cancelled in the same period. The capitalized value of this long annuity, assuming it to have been converted at the various dates of the transference of the items composing it, and according to the ruling prices of stocks from 1808—1829 (*vide* Tables J and K), is equal to about 448,000*l.* of 3 per cent. capital stock.* The latter sum added to the 10,919,000*l.* stock, before mentioned, gives an aggregate estimated amount of 11,367,000*l.* capital stock transferred and cancelled (*September*, 1808—*January*, 1829). This includes capital stocks other than 3 per cents to the extent of about 421,000*l.*, or not more than $3\frac{85}{100}$ per cent. of the aggregate of 11,367,000*l.* stock.

(*b.*) The perpetual annuity, cancelled by the transference of this aggregate amount of capital stocks, is shown by Tables F and G, to have amounted, as at the close of the financial year ended 5th January, 1829, to a net total of 332,000*l.* per annum (in round figures). This result is arrived at after careful estimate for each year, and corrections for the reductions of 5 per cents into 4 per cents in 1822-3. Adding the perpetuity equivalent to the long annuity cancelled, the 332,000*l.* becomes 350,000*l.* of perpetual annuity cancelled (*September*, 1808—*January*, 1829).

(*c*). The aggregate of life annuities granted from the commencement down to the end of the same period, was about 870,000*l.* per annum (*vide* Table H), from which subtracting an aggregate of life annuities expired, say 238,000*l.* per annum (*vide* Table H, *col.* 5), the remainder indicates the net amount of life annuities outstanding and charged upon the sinking fund, viz.—632,000*l.* per annum, on the 5th January, 1829.

(*d*). The additional annual charge, above the corresponding charge if no life annuities had been granted, was, consequently, at the date in question, the excess of the 632,000*l.* of life charge over the 350,000*l.* of perpetual annuity charge cancelled. The excess

* Or it may be otherwise defined that an aggregate of about 24,000*l.* of long annuity cancelled at various periods, as regards the items which compose it, may be taken as tantamount in value to an aggregate perpetuity of about 18,000*l.* per annum, valued at 448,000*l.* stock.

was then 282,000*l.* per annum above the perpetual annuity, and the total excess to continue during the lifetime of the annuity nominees.

(*e*). For an estimate, however, of money payments antecedent, and down, to the end of the period; the payments or charge under the long annuity, *without* capitalization, should be added to the payments under the perpetual annuities on capital stocks; for although it is immaterial, in the preceding paragraph, whether as a statement we take the estimated excess of charge under the life annuity scheme at 282,000*l.* per annum, on the 5th January, 1829, with allowance for capitalization of life annuity, or at 276,000*l.* if without allowance, *in that shape*, for such capitalization, it becomes material to the following remarks, that in the estimate of money payments we should review as nearly as possible the precise extra payments without such a capitalization.

In Table L, it is estimated, accordingly, that the payments of interest under the perpetual annuity on capital stocks, and under the terminable annuity on long annuity, transferred to the Commissioners on account of life annuities, supposing no redemption by, nor commutation into, life annuities, had so taken place (or, in other words, that the life annuity plan had not been adopted), would have amounted, in the period from September, 1808, to January, 1829, to about 3,308,000*l.* in cash payments without accumulation of interest thereon, either simple or compound.

(*f*). In Table L, it is similarly estimated that the payments to annuitants under the life annuity plan amounted to about 6,568,000*l.* in cash payments without accumulation of interest thereon, either simple or compound, during the same period.

(*g*). Comparison of the preceding figures shows that the excess of aggregate money payments under the life annuity scheme, as contrasted with the payments which would have been requisite had that scheme not been adopted, was about 3,260,000*l.* without interest. (September, 1808, to January, 1829.)

(*h*). It has already been stated (*c*) that the amount of charge upon the sinking fund for annuities payable by the Government during the future lifetime of the annuitants, was, at 5th January, 1829, about 632,000*l.* per annum. The question then arises,—what was, at that date, the then present worth, capitalized value, or reserve necessary to meet liabilities under such a charge?

Public statistics are quite deficient in the elementary data requisite for an exact solution of such a question. These data are not, however, of a more complicated character than returns, classified according to ages, and stating the amount of annuities depending on lives at each age.

If we were to admit, except as collateral evidence, the estimate of the liability under life annuities according to the figures adopted by the Select Committee of the House of Commons on Public Income and Expenditure* (*vide* their *fourth* Report, 10th July, 1828), we should in such a case be admitting an undervaluation of that liability in the element of the rate of interest involved. The other data, that is to say, the statistical accounts of amount of

* This is the Committee of which the late Lord Congleton (Sir Henry Parnell), was Chairman.

annuity outstanding at each age, we are bound to assume were duly enquired into, though not made public.

Reverting to the rate of interest. The rate at which the Select Committee valued the future payments of terminable and life annuities was $4\frac{1}{2}$ per cent. This was neither the rate which at this period (July, 1828) represented the past rate during the existence of the life annuity plan; nor was it the average rate which, looking to the past experience of that plan, should have been considered as some guide for the future.

In Tables J and K of the present paper, it is shown that the rate of interest at which life annuities could have been purchased from the Government during the continuance of the period (1808 to 1828) was much nearer to 4 than to $4\frac{1}{2}$ per cent. Looking to the then immediate indications of the financial condition of the country, and to the test of the then price of the funds, $3\frac{1}{2}$ per cent. would have been a more appropriate rate for the valuation of future payments than $4\frac{1}{2}$ per cent. At the present date (May, 1856), we have the advantage of 28 years of further facts as regards these prices, and as shown in Tables J and K, it appears that down to the 31st March, 1855, the average daily rate of interest on Government security has been no higher than 3*l.* 4*s.* 6*d.* (say $3\frac{1}{4}$ per cent. from 5th January, 1829, to 31st March, 1855.)

On the whole, $3\frac{1}{2}$ per cent. would have been a suitable rate for the approximate valuation in 1828, and to the extent of the difference between it and $4\frac{1}{2}$ per cent., we may properly modify the estimates then made.

The estimates referred to in the Report of the Select Committee of 1828, were based upon the terminable and other annuity charges outstanding, as at 5th January, 1828, and the sum at which the Life Annuities were deemed susceptible of capitalization, or of valuation to estimate the liability thereunder, was taken as equal to about $10\frac{1}{3}$ years purchase. This included the portion of liability attaching to 13,275*l.* per annum of outstanding deferred annuity.*

Our present estimate for the date of 5th January, 1829, embraces a period one year beyond that of the Select Committee of 1828. But as the annuity business was virtually stopped during the greater part of the year 1828, we shall not be far from the fact in estimating the deferred annuity outstanding in reversion at 13,000*l.*, on 5th January, 1829.

Valuing at $3\frac{1}{2}$ per cent., instead of $4\frac{1}{2}$ per cent., 11 years' purchase of the immediate and deferred life annuities, may, having due regard to all the considerations explained at full length in the preceding remarks, be taken as a sufficiently near approximation to the liability under, or capitalized value of, the future charge under these contracts, as at date of 5th January, 1829. Adding, therefore, the 13,000*l.* of deferred annuity outstanding, to the 632,000*l.* of immediate annuity outstanding, a gross future charge of 645,000*l.* per annum during the lives of the nominees then on the books of the

* The power to grant such deferred annuities was vested in the Commissioners through the provisions of the Act 57 Geo. III., c. 26 (year 1817), which has been before adverted to, but no regular statement of the growth of this charge is to be observed in the annual finance account of years prior to 1830.

Government, is thus ascertained, and the liability at 11 years' purchase was 7,095,000*l.**

(*i.*) Having so far collected the data on which to base the estimate of ultimate results, it appears from what has preceded, that to arrive at the money cost of redeeming 11,367,000*l.* of capital stock (*vide a. ante*), we must add the money payments in excess on the life annuity account, as compared with the money payments for interest on the capital stock (or perpetual annuity) account, viz. :— 3,260,000*l.* as before quoted (*vide g. ante*), to the liability on current annuities, viz., 7,095,000*l.* (*h.*)

The total of these two items, or 10,355,000*l.* is the money cost, without any allowance for interest, of redeeming the 11,367,000*l.* of capital stock. But, as has been explained at some length in the preceding sections of the present paper, this country had to provide additional funds from taxation and loans to meet the increased annuity charge which arose in each year, by the commutation of perpetual into life annuities. For this not only had the Government to provide interest by means of such fresh taxation and loans, but in the process of this provision, interest on interest was lost to the public, so far as regarded the power which the taxed public would otherwise have retained of employing this portion of their funds in industrial or other profitable undertakings of every description. The rate of accumulation by such means may, at the very lowest estimate, be taken at 5 per cent. for the period from September, 1808, to January, 1829. (*Vide* particularly the evidence taken before the Select Committee of the House of Commons in 1818, and before the Select Committee of the House of Lords in 1841, upon the Laws regulating the Interest of Money.)

In Table M will be found the full details of the extra expense thus incurred from year to year, and which indicate a total further outlay of about 82,000*l.* at 5 per cent. simple interest, or 1,500,000*l.* at 5 per cent. compound interest. (4,760,000—3,260,000.)

* The following tabular statement, in illustration of the per-centage ratio of expired annuities to the average amount of annuity exposed to the risk of mortality during the seven years immediately preceding the date of the period under examination, will be of some use as a guide to any approximate estimate of liability. Correction is, of course, needful for the possibility of more or less important fluctuations in the average annuity on each life.

1. Year ended 5th January.	2. Average Annuity at risk during the Year.	3. Annuity Expired and written off in the Year.	4. Average Per Centage for each Year.	5. Average for Periods of Years.	6. Per Cent.
	£	£			
1823.....	442,067	17,148	3·9	7 years	4·2
1824.....	496,402	25,586	5·2	6 ,,	4·4
1825.....	529,062	23,117	4·4	5 ,,	4·1
1826.....	546,218	26,083	4·8	4 ,,	4·0
1827.....	571,598	18,412	4·2	3 ,,	3·7
1828.....	603,393	26,331	4·4	2 ,,	4·0
1829.....	624,756	22,811	3·6	1 year	3·6
(7 years, 1823-1829)	3,813,496	159,488	....	7 years	4·2

It is important that due note should be taken of these figures, and we have separated them from the context of the tables, in order that no more than the proper degree of their influence upon the general question should be ascribed to them.

To the 10,355,000*l.* of money cost of redemption, 1,500,000*l.* for interest must therefore be added, making a grand total of 11,855,000*l.* as the aggregate expense of cancelling 11,367,000*l.* of capital stock (in the period from September, 1808, to January, 1829).

The average price at which the stock transferred to the Commissioners on account of life annuities, was ultimately redeemed, supposing the business liquidated at 5th January, 1829, was consequently about 104¼ per cent.

With the view of estimating the amount of loss to the public, with a sufficient degree of accuracy for any practical purpose, the only remaining point of inquiry is the ascertainment of the prices at which the capital stocks producing perpetual interest were transferred to, and may be considered as thereupon cancelled by, the Commissioners for the Reduction of the National Debt, on each purchase from them, or commutation of such stocks into life annuities between September, 1808, and January, 1829.

An abstract average purchasing price should, if possible, be discarded. The objections to assuming such an element of calculation have been felt to apply to the present occasion; besides which instruction was to be obtained in pursuing a more detailed, though certainly a more laborious, method. The results are tabulated in Tables J and K, and it will be observed (*Vide* Table F), that in the collective prices at dates of transfer to the Commissioners, proper allowance is made for capitalization of long annuity into consols, as regulating the terms of long annuity transfers according to the regulation of that part of the statute which affects such transfers; and, further, that regard is had to the correction applicable in respect of the reduction of the 5 per cents. into 4 per cents. The final result is to the effect, that the aggregate price at dates of transfer of the stock to the Commissioners, may fairly be estimated at 8,731,000*l.* for 11,367,000*l.* stock, being an approximate price of 75*l.* per 100*l.* of 3 per cent. stock, or 4 per cent. for money. On the other hand, the ultimate actual price of redemption, balancing the account as at 5th January, 1829, was, as has been previously shown, 11,855,000*l.*, or about 104¼ per cent.

The net money loss to the public may therefore, under the conditions previously explained, be estimated at the difference between the price of transfer and the price of redemption, on review of the whole course and effect of previous existing and expired transactions at any given date.

The date to which the preceding remarks have thus far extended is the 5th January, 1829, and at that date the difference in question amounted to about 29¼ per cent. loss on all the capital stock transferred or cancelled upon the purchase of life annuities; and the money loss to the Government, and consequently to the community at large, may correspondingly be estimated at the difference between 11,855,000*l.*, the actually accrued price of ultimate redemption at 5th January, 1829, and 8,731,000*l.*, the aggregate transfer price on

all life annuity transactions entered into between 1st September, 1808, and 5th January, 1829. Thus (stating the result in other words, and using the accustomed phraseology of similar statements), instead of each 100*l.* of *money* placed at the disposal of the Government by purchasers of life annuities, at the average price for transfer of 75*l.* money for each 100*l.* of 3 per cent. stock, having, as was anticipated, redeemed and cancelled 133*l.* 6*s.* 8*d.* of such stock, it really only redeemed and cancelled about 95*l.* 18*s.* of the stock; the ultimate ruling price of the transaction being as explained, 104¼*l.* money instead of 75*l.* money, for each 100*l.* stock.

The difference shows a net adverse balance of 3,124,000*l.* loss for the twenty years and four months ended 5th January, 1829.

In the absence of any publication, or of any data for the ascertainment, of the VITAL STATISTICS *of the Government Life Annuitants, it is impossible to say how much of this loss arose from the errors in the calculation of the tables as regarded the value of life* (taking into proper consideration the limits which to a certain extent existed in modification of those errors), or how much of the loss in question arose from the real defects in the principles upon which the Government has during the last half century embarked in the speculation of life annuity business, without the power of conducting such a business on the principles which ordinarily *regulate such a measure of finance, when conducted by trading bodies or individuals.*

But that the loss has in a large measure arisen from those inherent defects in principle will the more clearly appear when we extend our observations to what has taken place since 1829, *and down to the present time.*

V.—*Select Committee of the House of Commons on Public Income and Expenditure* (*Fourth Report of* 1828).—SINKING FUND.

On the 10th July, 1828, just two months after the date of the Act which rescinded the powers of the National Debt Commissioners to grant life annuities, the fourth Report of the Committee on Public Income and Expenditure (commonly called the Finance Committee) was ordered to be printed. The Committee stated in that Report that whilst they did "not deem it incumbent on them, in discharge of the duty imposed upon them, to express any opinion upon the subject of the past transactions connected with the sinking fund, they did not hesitate to declare that they could not under any circumstances recommend a sinking fund not provided by a real surplus of income."

On the following day Mr. Goulburn brought his budget before the House. Applying his remarks at considerable length to a discussion of the principles of the sinking fund, and to a defence of Mr. Pitt's original intentions upon the introduction of the measure, which, he contended, were in strict conformity with the principle that surplus of income over expenditure was the true foundation of a sinking fund, and that Mr. Pitt was only forced by circumstances to infringe upon that principle and to keep up a sinking fund by borrowing and creating fresh debts of a permanent character, Mr. Goulburn proceeded to express his concurrence in the view of the Committee that there was no alternative but to

commence from that period to reduce the nominal amount of the sinking fund to that of the real surplus of revenue, and concluded his remarks on the subject with these words:—

"If the House should acquiesce in my proposition, they would in future apply 3,000,000*l.* to the redemption of debt, which I believe to be equally for the advantage of public credit and the best interests of the country. It must be acknowledged that the existing system of incurring debt with one hand and redeeming it with the other, *was liable to the charge of delusion.*"

This important admission on the part of the Chancellor of the Exchequer called forth condemnations of the sinking fund from other members, one expressed his delight that that "glorious piece of nonsense was about to be extinguished," and Mr. Hume spoke of it as that "humbug scheme," and wished to see the words "Sinking Fund" abrogated from the language of the House.

Mr. Herries (the Ex-Chancellor of the Exchequer), who had contributed largely to the information collected by the Finance Committee, stated, in a subsequent part of the debate, that upon principle the old system of a sinking fund, in borrowing money to pay off debt, was objectionable. "*He admitted that the Chancellor of the Exchequer had, throughout his statement, considered the life annuities as forming a portion of the sinking fund; but that in reality those annuities subjected the country as much to a charge as any other portion of the debt, and that supposing there was no real surplus of income over expenditure, they must be considered as forming a real deficiency.*" "When, therefore, his right honourable friend called the surplus 3,800,000*l.* it undoubtedly included a sum of 617,000*l.* on the head of life annuities; and, deducting that amount, the whole real surplus would, therefore, appear to be about 3,200,000*l.*"—Mr. Herries did not pursue the subject further, but his remarks, in common with those of some speakers who had preceded him, are fairly open to the question whether any objections, proved to be valid in the case of the sinking fund, and of any fixed and compulsory borrowing in support of that fund, are not equally liable to the same censure of unsoundness in principle, and hurtfulness in practice, when perpetuated in the case of life, and other terminable annuities or loans, in which the obligatory sinking fund principle is retained in full operation?

Mr. Herries, in a previous part of his speech, in dissenting from the proposition of the Member for London (Mr. Ward), that this country was pledged to any special amount of a sinking fund, said it was not so pledged, save in the one single exception which proved the rule for which he was contending, viz.—a particular stock in reference to which a distinct compact had been made, that 1 per cent. per annum should be appropriated to its reduction. He "meant the $3\frac{1}{2}$ per cents."

With Mr. Herries's clear conviction of the identity of the life annuity plan with that of the sinking fund, it is remarkable that he expressed no objection to the infraction of the new principle recommended by the Finance Committee, which would be involved in every fresh annuity grant. For example:—an annuity is granted to a life aged 20 by the Government; the agreement on their part to

pay him an increased sum over and above the perpetuity upon the capital stock transferred and cancelled upon the purchase of the annuity taking place, may extend 60 or 70 or more than 70 years to come; during all this prolonged period of years the Government has to tax the public, *and to borrow fresh funds by way of loans on perpetual interest*, in all the alternations of war and peace, of commercial adversity and prosperity, and of good and bad harvests, to provide the petty, but obligatory, sinking fund to which the national good faith is pledged in this, as in every other, grant of a life annuity.

The facts which have been adverted to are certainly in favour of the view before expressed as to the subsidiary question of the degree of incorrectness of the Mortality Table employed in the life annuity calculations having diverted the attention of the legislature from the graver defects of financial principle inherent in the life annuity plan.

Those who have considered the progress of finance in 1828 need scarcely be reminded that the plan of an obligatory sinking fund of a definite amount was not immediately dispensed with. A Bill was introduced to appropriate three millions to the reduction of the debt, until the 5th July, 1829,* and the Act 9 Geo. IV., c. 90, was passed with that view, being only, however, a temporary measure to pave the way for the Act 10 Geo. IV., c. 27, of the next Session (1829), which gave the *coup-de-grace* to the old sinking fund and inaugurated the better principle that only such sums as shall appear to be the actual surplus revenue of the United Kingdom beyond the actual expenditure thereof, shall be applied towards the reduction of the National Debt.

Inasmuch as the life annuity plan applies *other* sums to such a purpose, it is at least so far antagonistic to the spirit of this final measure with regard to the sinking fund.

The Act of Parliament last referred to provided that the separate sinking fund account should be closed and transferred to the Consolidated Account, and this, of course, affected the mode of charge of the life annuities: consequently we find, in the finance accounts for the year 1829, a memorandum, by the Comptroller-General, signifying their transference from the sinking fund to the consolidated fund, at and after 5th July, 1829.

VI.—*Government Life Annuity Plan, introduced in* 1829 *by the Right Honourable Henry Goulburn; with Note upon the Projected Government* Life Insurance Plan, *in Connection with Life Annuities.*

In the meanwhile the observations which the Government had instituted upon the mortality results of the old tontine and other Government annuitants, had been brought to a close, and although (as has been explained) the resolutions of the House of Commons and its acts, in regard to the sinking fund, applied, in spirit, so entirely to the life annuity plan, as an integral portion of the sinking fund, that the power to grant further life annuities might most consistently have been taken away from the Commissioners; it did not, however, appear to have been the desire of the Government to have the greater and the less sinking fund considered simultaneously, for they brought in a measure connected with the less, whilst the question of the greater was pending.

* Mr. Huskisson was of opinion that a larger annual sum should be set aside for the purpose.

In February, 1829, the House resolved itself into Committee, on the new Life Annuity Bill, introduced by Mr. Goulburn, as Chancellor of the Exchequer. The right hon. gentleman did not address himself at all to the general principles of finance or public economy involved in the scheme, and, in this respect, his statement compares unfavourably with that of Mr. Perceval, on the like occasion, in 1808. The whole of Mr. Goulburn's speech amounted to little else than a lecture on that somewhat threadbare subject, the Northampton table of mortality, as compared with other observations on vital statistics in general, and with the new Government observations in particular. Special stress seems to have been laid on a very questionable proposition, submitted almost as an axiom, that, because Dr. Price's observations had reference to a small number of persons, "he (the Chancellor of the Exchequer) believed no more than 7,000 or 8,000, the House would perceive that the new calculations could not fail to be more accurate, because the lives embraced in the Government observations would include the tontine commenced in 1693 and ended in 1782, those who received exchequer annuities in 1745, 1746, 1757, 1766, 1778, and 1779; the holders of Irish tontines in 1773, 1775, and 1778; and of the English tontine in 1789." Not satisfied with this medley of lives, chosen at various dates, Mr. Goulburn said that to them would be added the lives of those who had purchased annuities for the last 20 years under the Act which regulated annuities for lives, and that the mass of lives on which the observations would be made would amount to about 24,000.

Mr. Goulburn's statistics were here somewhat at fault. The new calculations, which were made the basis of the rates introduced by his measure, were not formed upon a larger number of complete observations than 6,679. By complete observations is here meant lives entered upon the Government books as annuitants, and remaining on those books until the dates of their death, such dates of death being prior to the ultimate date to which the observations extend. To the number just mentioned may be added 12,119 incomplete observations, by which is here implied lives entered upon the Government books as annuitants, and remaining on those books, as still living, at the ultimate date to which the observations extend.* The introduction of so many incomplete observations—nearly two-thirds of the whole

* The working observations may be scheduled as follows:—

Description.	Number of Lives.	Deduct Living in 1826.	Complete Observations.	Incomplete Observations.
a. 3 Irish Tontines of 1773, 1775, and 1778	3,557	1,564	1,993	1,564
b. Tontine of 1789, viz., Contributors' Nominees	3,518	2,203	1,315	2,203
Government do.	4,831	3,008	1,823	3,008
c. Sinking Fund Annuities from 1808 to 1826	6,892	5,344	1,548	5,344
Totals	18,798	12,119	6,679 +	12,119
			18,798	

number of observations, had the effect of very much marring the degree of reliability to be placed upon the deductions therefrom at the more advanced periods of life; the result being to increase the liability to error, in under-estimation of the vitality at such periods, as practically indicated by comparatively high rates of annuity.

In Table C of the Appendix is a condensed abstract of specimens of rates, at various ages and prices of stock, and which should be compared, in detail, with the Table A of the Appendix before explained, as illustrative of the rates required, from 1808 to 1828. It will be noticed that the rates under the new table are *higher* than under the old table for male lives, at all ages above 60, when the price of the funds is 85*l.* 2*s.* 2*d.* and upwards, and at all ages above 70, whether of males or females, when the price of stocks is 99*l.* 3*s.* 6*d.* We do not enter into further comparisons with other tables and other rates in practical use here and on the continent, as it would exceed the due limits of this paper to do so.

Mr. Goulburn, in introducing the new measure, did not so much as entertain the question whether a balance of profit or loss might result therefrom; on the contrary, he seemed to lay it down as an axiom that it would be entirely self-adjusting. He stated that his only object was to extend the principle laid down in the former act, repealed in the preceding session, and to establish a more accurate basis, for calculating the value of annuities, in order to combine with the greatest possible convenience to that part of the public interested in the purchase of annuities, *security against loss on the part of those who granted them.*

A great contrast is here presented to the tenor of the remarks of Mr. Perceval on his introduction of the former Act, when he candidly admitted that the scheme would only hold good when prices of stocks should happen to be low and likely to rise, and the contrary when they should happen to be high! Mr. Perceval acted up to his convictions by fixing a maximum rate of annuity at a comparatively low price of stocks, but Mr. Goulburn quite overlooked this safeguard.

To confer an additional attraction upon his measure, Mr. Goulburn introduced some new branches of business to be undertaken by the Government. The chief of these was the grant of deferred contingent annuities on lives, in consideration of the payment of *annual* premiums by the purchasers. Such deferred annuities were to commence at the end of whatever period of time the bargain might be made for, in case the nominee should survive.*

It is difficult indeed to conceive how such a business, or, rather, such a speculation, could ever realize the exordium of Mr. Goulburn's address, as to the Government being absolutely secured against loss. Viewing the matter as an ordinary business operation, an individual, or trading body, would look for protection against loss to a very considerable extent in the profitable investment of each annual premium as it fell due, but how could the Government, which neither can trade (in the legitimate acceptation of the term) nor invest,

* This measure was introduced by Mr. Goulburn, prior to the sitting of the Select Committee of the House of Commons, appointed to consider the petition of Mr. Cadogan Williams, and which reported in June, 1829.

except in its own securities, ever accomplish such an object? What then is the state of the case as regards the Government? Simply this:—a given rate of interest is assumed in the first instance as regulating the transaction. That rate is the ruling element of the terms of the whole future of the transaction, but if the price of the funds rule higher at any of the due dates of the premium, the Government lose proportionately to the increase of the price at each cancelment of the stock which they purchase, with the money forthcoming from the annual premiums. Granted, that the contrary rule may prevail in the case of a falling market for stocks; but who can predicate the security of the transaction, or the balance of profit and loss? The plan is open to all the objections which are valid against the Government Immediate Life Annuity plan, increased in the proportion of the number of years during which the annuity is deferred, but differing as adversely affected by a *rise* in the Funds.

Mr. Goulburn looked upon this part of his measure as a great boon to the public—anticipated that "a large class would be anxious to avail themselves of it," and averred that the public "would thus be enabled to make a future provision, not by encroaching upon their capital (?) but by the exercise of thrift, by paying a portion of their annual income."

The course of the Chancellor of the Exchequer's observations would appear to have been intended to impress the House of Commons with the conviction that a great provident and deposit office would at once be put into active operation under Government guarantee (and, of course it may be understood, without charge for that guarantee). It is again remarkable that statistics of the former experience of the Government in their deferred annuity business under the old plan, were not referred to as some guide to the probable amount of business to be effected under the new scheme. Such a reference would have shown that the deferred annuity business extended only to a very insignificant amount under the Government scheme instituted in 1817 upon the single premium basis, and which, any one used to calculations of life contingencies must be aware, is more attractive to the purchaser than the annual premium system when calculated by the Northampton rate of mortality, or other table of a like character. So small indeed was the business done, that, as before observed, in the year 1828, the aggregate outstanding annuities little exceeded 13,000*l*.

The best proof, however, that Mr. Goulburn was harbouring a fallacy, is to be found in the statistical test of the business transacted since the date of his measure (1829) under the deferred annuity plan. This proves that so slow has been its advance, so ill appreciated the proffered advantages, that at 31st March, 1855, (being the last date to which the total is attainable) the aggregate outstanding amount of deferred annuity on the Government books, was no more than under 30,000*l*.

The figures of the deferred annuity business for each of the years 1829 to 1855, are given in Table N of the Appendix; and the deduction is, that viewed in the light of a national measure—and however well intended—the scheme is an utter failure. And this result has been obtained, even in the face of the adventitious aid and publicity

given to the scheme by certain supplementary Acts of Parliament, viz.; the Acts 3 William IV., c. 14; 7 and 8 Victoria, c. 83; 16 and 17 Victoria, c. 45, bringing the savings' banks into immediate connexion with the National Debt Office, as feeders to the plan of deferred and immediate annuities. (*Vide annexed note for a full statement on this part of the subject, and also upon the life insurance schemes projected on two occasions by the Government.**)

* The Act 3 Will. IV., c. 141, passed 10th June, 1833, enables depositors in savings' banks, and others, to purchase government annuities through the medium of savings' banks. The annuity on any one nominee not to exceed 20*l.*, and no nominee to be under the age of fifteen years. Instead of the price of the annuity being regulated by the price of the funds, or the rate of interest in the market for government securities, as was the case with other annuities granted by government, one uniform rate for money was specially allowed in fixing the price of the annuity. This act (*vide* clause xviii.) provided that if annual payments are not kept up, or if the party die before the annuity commences, all the payments made are to be returned. The effect of this was to create in the National Debt Office a State Deposit Office, as an auxiliary to depositors in savings' banks, or to any individual possessed of sufficient money to defray the expense of an annual premium for a deferred annuity of 20*l.*, thereby enabling such individuals to withdraw their payments at any such time as might be convenient (or, from ill health supervening, expedient) for them to do so. The terms for such contracts necessarily required a comparatively heavy rate of premium, although it may be doubted whether the rates were really high enough when we consider the right of option to discontinue payments, and to receive back previous contributions. In accordance with the principles laid down in the paper to which this statement forms an appendix, it would appear as objectionable for the government to pledge itself to a return at any time of moneys paid to it for the grant of life annuities, as it appears for it to undertake any such grants at all. The want of success of the measure adverted to in the paper is sufficiently shown in the very small increase to be discerned in the annexed table between the years 1833 and 1844. (*Vide* TABLE N *of* APPENDIX.)

On the 9th August, 1844, an amending Act (7 and 8 Vict., cap. 83) was passed, which extended the maximum life annuity from 20*l.* to 30*l.*, and granted power to return deposits, to the extent of 50*l.*, to personal representatives without will or administration. These circumstances, but, perhaps, more particularly the publication of fresh tables, under which, at a lower rate of contribution, deferred annuities might be purchased with absolute forfeiture of premiums in the events of death or of discontinuance of the contract, led to a somewhat increased business, as may be seen from the figures for the years 1845 to 1852. Since then the business has receded; and, one way and another, the outstanding deferred annuity was 4,439*l.* less in 1855 than in 1852.

The Act of 16 and 17 Vict., c. 45, was passed, 4th August, 1853, and under this new Act certain alterations affecting the details of the business transacted through savings' banks and provident societies were carried out, but in other respects, the power of the Commissioners to grant life annuities upon special rates, for the benefit of any depositor in a savings' bank, or other person whom the Commissioners may think entitled to be or become a depositor in a savings' bank, was continued.

A further option was given by the seventh clause of this Act, which, in the sense of the preceding observations, is also an option exercised against the national advantage; viz., that where a party has contracted, by payment in one sum, for a deferred life annuity, the Commissioners may, at the option of the party, grant an immediate life annuity, in place of the deferred life annuity.

Clause X. of the Act empowers the Commissioners for the Reduction of the National Debt to grant Government *life insurances*. It provides that the said Commissioners may contract with any depositor in a savings' bank, or whom they may think entitled to be or become such, for the payment of a sum of money on his or her death, provided that the party contracting for such payment on death shall, at the same time, purchase a deferred annuity, depending upon his or her own life, as the case may be, and that the money payable on death do not exceed the amount of the

On the 22nd May, 1829, only ten days before the abolition of the Sinking Fund, the new Government Life Annuity Act, as introduced by Mr. Goulburn, was passed, and is still in full force. Under this Act (10 George IV., c. 24), the life annuity powers of the Commissioners for the Reduction of the National Debt are revived, and the enactment authorizes them to accept the transfer of capital stock

sum paid down for the said payment on death, and annuity taken together, and shall in no case exceed 100*l.* in the whole.

The public are not informed as to the terms upon which such life insurances are granted, or whether any contracts of the kind have been entered upon. If they have, it is a very decided infraction of the sinking fund principle, and is further utterly inconsistent with the life annuity business, as it simply undoes what the latter is supposed to do; for, if we were to admit that the latter extinguished debt, it follows that the former must create debt. Apart from all other objections to the state embarking in the business of life insurance, it must be obvious that every contract which the Government enters into for the payment of a sum of money at death, is tantamount to their raising a fresh loan, and only differs in two respects from ordinary loans, viz., in the first place, that, whilst in the case of the usual form of loan, the Government provides for and discharges the half-yearly interest as it becomes due; in the case of the life insurance loan, it allows interest upon interest to remain in arrear, and defers the payment of the accumulated amount until the deaths of the parties insured. In the second place, whilst in the usual form of loan, the contract is at the commencement as fixed, certain, and defined as the rules of finance will allow of; in the insurance loan it is otherwise, and the contract is affected by all the considerations connected with the business of life insurance, a business which it would be impossible for a Government to conduct with profit to itself and the community at large.

It may be observed, by referring to the Bill as originally prepared on the introduction of Mr. Goulburn's measure, that a wish to embark in life insurance schemes is not new to the Government (*vide* Bill No. 59, 10 Geo. IV., sess. 1829. Ordered by the House of Commons to be printed, 27th February, 1829). The Bill just referred to contained a project (*vide* page 2) to authorise the Commissioners for the Reduction of the National Debt to grant annuities upon the continuance of single or of joint lives, or for any limited term of years, *in reversion*, after any other single life, or after any two joint lives, and the life of the longest liver of them, or after the joint continuance of any two joint lives. A further part of the Bill (vide page 3) proposed making it lawful for the Commissioners to accept any sum of money *by the year*, in addition to their powers to accept transfers of stock as the consideration for such annuities. Using the technical expression, the Commissioners were to be empowered to receive annual premiums for insurance as well as single premiums.

Those unused to the theory or practice of insurance might not, at the first sight of the Bill, have seen that the phraseology of its provisions was intended to introduce Government life insurance under the guise of annuities in reversion. But the truth was sufficiently obvious to those who applied a further scrutiny; and it appears that some representation was made to the Government to the effect that if, for example, an individual wished to insure any life for, say, 10,000*l.* with the Government, he could carry out this object by purchasing from the Government an annuity in reversion of 5,000*l.* per annum for two years certain, such annuity to commence at the decease of the life it was desired to insure. On the other hand, by the assured exercising the option of paying his premium annually, he was to be put in exactly the same situation as in an ordinary life insurance contract, with the one unimportant difference that, instead of receiving the sum insured in three months from the time of decease of his nominee, as is the case in the usual practice of life insurance, he would receive it from the Government in four half-yearly payments of 2,500*l.* each. In saying that this difference was an unimportant one, the fact may be proved, for assuming, as an example, that the Government obligation to pay an annuity of 2,500*l.* for four half years certain, would be a marketable security convertible into cash at, say, 4 per cent. discount, in such case all that the party insuring needed to have done to put himself in the same position, as in an ordinary contract for

of any denomination, or long annuities, or money, and in consideration thereof, to sell or grant annuities to one life, to two joint lives, or to the survivor of two lives; also annuities for terms of years; in any case without limitation of the amount of the annuity, and with no limitation as to age, except that no nominee must be under 15 years old; neither is there any limitation to British subjects except in the case of an annuity purchased on the life of another.

The preamble of the Act is somewhat inconsistent with its 3rd clause, for, whilst the preamble declares it to be expedient that the Commissioners should be enabled to grant annuities, in future, according to the duration of human life, as ascertained by recent tables of observation thereon (meaning the Government observations), the clause 3 confers discretionary power on the Commissioners for the Reduction of the National Debt, subject to the approval of the Lords Commissioners of the Treasury, or any 3 or more of them, to use any table or tables of rates. By clause 14, publication, in the "London Gazette," of such approval of a change of tables is rendered obligatory.

Purchasers of annuities are enabled to appoint nominees, being natives of the United Kingdom, so that picked lives can be selected and a speculation entered into, against the interests of the Government and the tax-payer, and this has frequently been done and with great success to the purchasers. A discretionary power is, however, conferred, by the Act, on the Commissioners, or their comptroller or assistant comptroller, to refuse to grant any annuity on "sufficient grounds;" and, owing to the losses which they felt were being sustained, through the selection of nominees, *particularly at advanced ages, at which the correctness of the Government tables is very doubtful*, the Commissioners, some years back, framed a notice which is still in force, that they will not grant any annuity on a life aged above 65, unless the nominee shall have, *bonâ fide*, a beneficial interest in such annuity. The needful extent of such an interest is not defined; but, however that may be, there is no doubt whatever that considerable profit has been made, by the adventurers, and loss to the Government incurred, by speculations in annuities, on selected lives, generally in the humbler ranks of life, and resident in healthy agricultural and Highland districts, or belonging to families whose hereditary longevity is beyond the average. Such nominees have usually received a fraction of the annuity, to keep alive their beneficial interest and to preserve them in a better condition to sustain a prolonged vitality.*

insurance, payable at the end of three months from the decease, would have been to insure an annuity of 5,216*l.* per annum for two years, *i.e.*, four half years from the decease of the party insured; and this annuity discounted at the end of three months would have just been worth the 10,000*l.* he desired to insure.

We need scarcely remark that this projected life insurance plan, under the cover of an annuity plan, did not become law, and was omitted from the Act 10 Geo. IV., c. 24. Clause X of the Act of 1853 (16 and 17 Vict., c. 45) may, therefore, be considered as the first introduction of life insurance business into the financial operations of the Government.

* For some important information on the mortality experienced amongst 95 lives so selected, in Scotland, *vide* a paper contributed to the "Assurance Magazine," in January, 1851, by Mr. W. T. Thomson, of Edinburgh.

Clause XVII. of the Life Annuity Act is, financially and statistically considered, of a character utterly undeserving of defence, either on the plea of expediency or propriety. This clause is altogether so remarkable a specimen of a legal enactment to confuse accounts and prevent due knowledge of the subjects of which they treat, that it does some discredit to any government which maintains it, as well as to the administration which introduced it.

The clause, in full, is as follows :—

XVII. And be it further enacted, That all life annuities, of whatsoever kind, which shall be purchased and granted under the provisions of this Act (whether such annuities shall commence immediately or not, shall, in their due course, as the same shall fall due and become payable, *be added to and shall form part of the Life Annuities payable at the Bank of England under any Act or Acts heretofore in force enabling the Commissioners to grant Life Annuities;* and all annuities for terms of years, which shall be purchased and granted under this Act, shall be carried to a separate account in the books of the Governor and Company of the Bank of England, and the books of the Commissioners for the Reduction of the National Debt, under the title of "Annuities for terms of years granted by the Commissioners for the Reduction of the National Debt, pursuant to Act of the 10th George the Fourth;" and the said annuities for terms of years *shall be comprehended in one general account, notwithstanding the said annuities shall continue for various terms of years.*

In the above quotation we have italicised the words of the clause which lead, as a necessary consequence, to the combination into one mass of the heterogeneous elements of life annuities granted under different systems and upon discordant tables of mortality; so that, instead of any results being before the public in the divisions of Old and New series, or Series 1 and Series 2 of life annuities granted by the Government, there is but one crude and unanalysed statement, and that of a particularly unsatisfactory character, when we bear in mind that the transactions which it concerns can only be understood upon the strict rules and order of arrangement which are necessary to be observed on questions of national finance and statistics.

As if to add a climax to this confusion, so far as public information is concerned, the clause threw into one general heap (for it cannot be called an account) the annuities granted for terms of years certain, varying from 10, 11, 12, &c., years (increasing in the order of the natural numbers), up to 100 years.

The life annuities might easily be divided into classes, according to the Acts of Parliament and system under which they were granted, and showing the annuity outstanding at each age; and the annuities for terms of years, of which no less than about 894,000*l.* per annum (exclusive of course of long annuities), were outstanding, at 31st March, 1855, might, with no great difficulty, be arranged in a schedule to the annual finance accounts, separating and setting forth the dates at which the amounts of annuity for various terms, and comprised in the great aggregate charge, will respectively expire. Exact dates in the year would obviously be useless, but a statement setting forth that so much terminable annuity will certainly expire in the financial year 31st March, 1856, to 31st March, 1857, and so much from 31st March, 1857, to 31st March, 1858, &c., &c., would answer every purpose of a general account.

The charge under the new annuities having thus been mixed up

with the charge under the old annuities, the results of the new scheme cannot possibly be sifted from those of the old scheme. The only complete separate statistics which can be extracted, in such a way as to admit of a comparison, extend only to our being able to ascertain the extent of the new transactions of the respective periods 1808 to 1829, and 1829 to 1855. All other data from 1829 to 1855 resolve themselves into combined statements, affecting the results of both periods.

Notwithstanding these intrinsic defects, some deductions of considerable utility and of an instructive character may be drawn from the consideration of the collective results of the entire mass of life annuity operations, from 1808 to 1855, a period of between 46 and 47 years, in the same way as, in a preceding part of this paper, the collective results of the annuity business, down to 5th January, 1829, were reviewed. The following remarks will, therefore, take up the data at the point where that review terminated, or, rather, it will include and continue them, subject, however, to the following exceptions and necessary amendments.

1st. The liability, as at 5th January, 1829, upon the outstanding life annuities, must be omitted altogether from the estimate we are about to make for the years 1808 to 1855, and an estimate of the liability upon the outstanding life annuities, as at 31st March, 1855, must be substituted for it.

2nd. An increased average price of stocks at the dates of commutation into life annuities must be allowed for as regards the period 1829 to 1855.

3rd. A lower rate of interest, and, consequently, a diminished loss to the public, must be assumed in the estimate of the loss accruing from the increased taxation raised on account of the grant of life annuities, and of the accumulated charge under previous grants, in the period 1829 to 1855.

Subject to the preceding remarks, and adopting the same methods of calculation which have been explained in the statements relative to the period 1808—1829, and referring the reader to the tables of the Appendix for such analysis of the comparative amounts and averages of the separate period 1829—1855, as could be deduced from the published data in the annual finance accounts, the following observations will have regard to the two periods comprised within the dates of 1st September, 1808, and 31st March, 1855, *taken in one general view*, and, as conducive to clearness and to facility of comparison with the deductions which have already been made in respect of the first period (1808—1829), nearly the same phraseology will be adopted, and the paragraphs lettered in the same way, but with the distinguishing mark of an asterisk.

VII.—*Financial Statistics and Results of Government Life Annuities granted during the combined Second Period, September*, 1808, *to January*, 1829, *and January*, 1829, *to March*, 1855.

(*a**). The collective results of Table D, show that the amount of capital stock of various denominations transferred to and cancelled by the Commissioners for the Reduction of the National Debt, on account of life annuities granted between the years 1808—1855, was

nearly 29,694,000*l.*; and that, in addition, a total long annuity of about 25,000*l.* (expiring in 1860 had it not been transferred) was cancelled in the same period. The capitalized value of this long annuity, assuming it to have been converted at the various dates of the transference of the items composing it, and according to the ruling prices of stocks from 1808—1855 (*vide* Tables J and K), is equal to about 458,000*l.* of 3 per cent. capital stock.* The latter sum, added to the 29,694,000*l.* stock, before mentioned, gives an aggregate estimated amount of 30,152,000*l.* stock transferred and cancelled (September, 1808—March, 1855). This includes capital stocks, other than 3 per cents, to the extent of about 4,970,000*l.*, or under 16½ per cent. of the aggregate of 30,152,000*l.* stock.†

(*b**). The perpetual annuity, cancelled by the transference of this aggregate amount of capital stocks, is shown, by Table T, to have amounted, as at the close of the financial year ended 31st March, 1855, to a net total of 891,000*l.* nearly, in round figures, after careful estimates for each year and corrections for the reductions of 5 per cents into 4 per cents in 1822-3; of the new 4 per cents into 3½ per cents in 1830-1; of the 4 per cents of 1826 into 3½ per cents in 1834-5; of the 3½ per cents into 3¼ per cents in 1844-5; and of the 3¼ per cents into 3 per cents in 1854-5. On the other hand, additions have to be made, in various years, equivalent to the long annuity cancelled in its then proportions to perpetual stock, and the 891,000*l.* per annum thus becomes increased to 909,000*l.*, nearly, of perpetual annuity cancelled‡ (September, 1808—March, 1855).

* Or, it may be otherwise defined, that an aggregate of about 25,000*l.* of long annuity, cancelled at various periods as regards the items which compose it, may be taken as tantamount in value to an aggregate perpetuity of about 19,000*l.* per annum, valued at 458,000*l.* stock.

† Some may be more disposed to take 30,296,000*l.* as the nearer approximation to the truth, when their notice is called to the circumstance that, in a return from the Comptroller-General of the National Debt Office to an order of the House of Commons, and dated 20th April, 1853, it is stated, that 144,415*l.* 9*s.* 4*d.* of *Exchequer Bills* were purchased, pursuant to 11 Geo. IV., c. 26, and cancelled in the year ending 5th January, 1831, *on account of annuities for lives* (vide Parliamentary Paper, No. 413, moved for by Mr. John B. Smith). Compare these figures, however, with those under the same head and designation, in a like return from the Comptroller-General of the National Debt Office, to an order of the House of Commons, and dated 6th August, 1851 (*vide* Parliamentary Paper, No. 657, moved for by Mr. Scholefield); and the *same item* will be found printed at 904,500*l.* We are entitled to consider the 144,415*l.* 9*s.* 4*d.* as the revised and corrected statement, though the fact of the great discrepancy is not pointed out in the document of 1853.

‡ With reference to the above paragraph, and to the previous note, as to an amount of 144,415*l.* 9*s.* 4*d.* of *Exchequer Bills* purchased by the Commissioners on account of annuities for lives, and cancelled in the financial year ending 5th January, 1831, it would at first sight appear that some allowance should be made for the interest thereby cancelled, say at 4 per cent., nearly 5,800*l.* per annum. But, *per contra*, let the additional charges of management incurred by the Government in the grant of life annuities be considered; and further, let it be carefully borne in mind that, in the item of stamps under the annuity Acts, and from which, as well as from enrolment, the life annuity Acts excepted Government annuity contracts, and thus led to a very considerable loss of revenue to the Government, or rather to a shifting of the burden from those to whom it belonged to those to whom it did not belong; and we will venture to anticipate that the item of 5,800*l.* per annum, from 1830 to 1855, may most properly be omitted in the balance.

As regards expenses of management of the Government life annuities, it may be

(*c**). The aggregate amount of life annuities granted during the whole period commencing September, 1808, and ending March, 1855, was about 2,718,000*l.* (*vide* Table H), from which amount, subtracting an aggregate of expired life annuities to the extent of 1,681,000*l.* (*vide* also Table H), the remainder indicates the net amount of life annuities outstanding and charged (under the Act of Parliament 10 Geo. IV., c. 27) upon the consolidated fund, viz.—about 1,037,000*l.* per annum of life annuity as at 31st March, 1855. (*Vide* Table H, for statements as to the outstanding amount for each financial year from 1808 to 1855.)

(*d**). The additional annual charge, above what the corresponding charge would have been if no life annuities had been granted, was, consequently, at the date in question, the excess of the 1,037,000*l.* of life charge over the 909,000*l.* of perpetual annuity charge, cancelled (*b**). The excess was then 128,000*l.* per annum above the perpetual annuity, and the total to continue during the lifetime of the annuity nominees.

(*e**). In Table L, it is estimated that the payments of interest, under the perpetual annuity on capital stocks, and under the terminable annuity on long annuities, transferred to the Commissioners on account of life annuities, supposing no redemption by, nor commutation into, life annuities had so taken place (or, in other words, that the life-annuity plan had not been adopted) would have amounted in the whole period, from September, 1808, to March, 1855, to about 19,348,000*l.* in cash payments, without any accumulation whatever for interest.

(*f**). In Table L, it is similarly estimated that the payments to annuitants, under the life annuity plan, amounted, during the same period, to about 29,199,000*l.* in cash payments, without any accumulation whatever for interest.

(*g**). Comparison of the preceding figures shows that the excess of money payments, under the life annuity plan, as contrasted with the payments which would have been required if that plan had not been adopted by the Government, was the excess of 29,199,000*l.* over 19,348,000*l.*; viz., 9,851,000*l.* without any accumulation or addition for interest, simple or compound. (September, 1808—March, 1855.)

(*h**). It has already been stated (*d**) that the amount of charge upon the consolidated fund for annuities, payable by the Government during the future lifetime of the annuitants, and on the books of the Government, as at 31st March, 1855, was about 1,037,000*l.* per annum. The problem for immediate solution, in connexion with this part of the subject, is the ascertainment of the liability under this charge reduced to present worth; or, otherwise expressed, the

useful to observe, that it appears, in a return from the Treasury, of the *Civil Service Estimates* for the year ending 31st March, 1857, that the sum which may be required in the year 1856 to pay the salaries, contingent and other expenses in the National Debt Office, is 13,880*l.* This is exclusive of 1,604*l.* for rent and taxes, provision for which is made in the estimate for public buildings; and it is open to question whether by far the largest portion of the aggregate estimate of, say, 15,484*l.*, or in round figures, 15,000*l.* a-year, may not be set down as arising out of the annuity business, particularly the salaries of thirty-two clerks, amounting in the aggregate to 8,590*l.* per annum.

capitalized value of the reserve in present money, which would be just sufficient and no more to meet the future liabilities accruing thereunder.

In referring, in the previous sections of this Paper, to the entire deficiency of public statistics, in respect of the data on which such an estimate could be approximately made with any degree of facility, it was pointed out that all that was wanting at the period then under review (viz., from 1808 to 1829) was a statement, as at a given date, of the amount of immediate annuity depending, or outstanding, on lives at each age. These data are as unattainable now as they were in 1829, and with this further difference, that, whilst in 1828 the public had the advantage of some general statements, without, however, the elementary data, on the subject of the proportionate capitalized value of terminable and life annuities, as compared with perpetuities, and which, as before explained, formed the basis of some estimates in the Reports of the Finance Committee of 1828, the same does not apply to the present period (1855 to 1856); and, although the amount of charge has become one of greater importance, neither details nor estimates are before the public; and (as has been explained and commented on in previous parts of this paper) the heterogeneous items of life annuities under one system, and life annuities under another system, and terminable annuities for all kinds of periods, have been fused together by Act of Parliament.

In default of precise data on which to estimate the liability, recourse may legitimately be had to such particulars, indirect though they may be, which can serve to give something like an approximate idea as to its extent.

A similar statement to the one referred to in a previous part of this Paper (*vide* note to *h*), and which there formed only a collateral test of the observations in the text, will here be of more importance. The former statement was for the financial experience in certain results from 1823 to 1829, being a term of seven years immediately preceding the close of the period ended 5th January, 1829; the annexed statement (*vide* note* at foot) is for the financial experience

* 1. Dates.	2. Average Annuity at Risk during each Period.	3. Annuity Expired and Written off in each Period.	4. Average Per Centage Ratio of Column 3 to Column 2.	5. Average for under-mentioned Periods ending 31st March, 1855.	6. Per Centage for Periods mentioned in Column 5.
	£	£		Years.	Average Per Annum.
1 year ended 5th Jan., 1849	891,507	51,714	5·8	7¼	5·5
1 ,, ,, 1850	893,722	42,117	4·7	6¼	5·6
1 ,, ,, 1851	940,274	41,725	4·4	5¼	5·4
1 ,, ,, 1852	982,274	54,834	5·6	4¼	4·7
1 ,, ,, 1853	1,021,958	55,892	5·4	3¼	5·6
1·25 ,, 5th April, 1854	1,059,482	72,462	6·8	2¼	5·7
0·99 ,, 31st Mar., 1855	1,048,715	63,346	6·1	1	6·1
7¼ years (nearly)	6,837,932	382,090	5·5	7¼	5·5

of the same class of results from 1849 to 1855, being a term of seven years and a quarter immediately preceding the close of the period ended 31st March, 1855.

It will be noticed that the average per-centage per annum of annuity expired to annuity at risk, which was $4\frac{1}{5}$ per cent. in the years 1822-1828, increased to $5\frac{1}{2}$ per cent. in the years 1848-1854. This is of course evidence, to some extent, in favour of our assuming that the average age of the annuitants on the books of the Government, as at 31st March, 1855, is greater than the average age was at 5th January, 1829. The precise degree of difference cannot be arrived at without publication by the Government of the detailed statistics as to the number of lives at various ages, and the mortality results from 1828-1855. The amount of annuity, written off on the death of any one life, may amount to from 5*l.* a-year to 50,000*l.* a-year, or upwards, the limiting power of the older statutes having been abolished. With this great element of disturbance, which applies with more force to the business since the year 1829 than to that before it, it becomes very difficult to form any estimate which we can satisfactorily consider will approximate *very* closely to the fact as to the real liability of the Government under its life annuity contracts, as at 31st March, 1855. In the previous section of this Paper, some reasonable grounds were adduced on which to estimate the liability, at 5th January, 1829, as eleven years' purchase, reckoning interest at $3\frac{1}{2}$ per cent.

Under all the circumstances, and considering that the average tendency of the rate of interest realisable on Government security has been about $3\frac{1}{4}$ per cent., or (as compared with the period prior to 1829), a quarter per cent. lower than $3\frac{1}{2}$ per cent., and looking to the general evidence on other points bearing upon the case, it does not seem that we should be justified in valuing the annuities outstanding on the books of the Government at less than at least 9 years' purchase, on the 31st March, 1855.

On this basis and making allowance for deferred annuities, to the amount of about 29,000*l.* per annum, in addition to immediate annuities of 1,037,000*l.* per annum, we may estimate the liability under the gross future charge of 1,066,000*l.* per annum, during the lives of the nominees on the books of the Government, at 9,594,000*l.*, on the 31st March, 1855.

(*i**). To the liability just mentioned, viz., to 9,594,000*l.*, must be added the money payments (from 1808 to 1829), in excess on the life annuity accounts, as compared with the money payments for interest on the capital stock or (perpetual annuity) account, viz., an excess of 9,851,000*l.*, as before quoted (*vide g* ante.*)

The total of these two items, or 19,445,000*l.*, is the money cost, without any allowance for interest, of redeeming 30,152,000*l.* of capital stock (*vide a* ante.*) But here, it must be repeated, this is a mere cash statement, irrespective of the element of interest on past payments, of the pivot on which the whole business turns, and we must again advert to the fact that the nation has had to provide (and is at this moment, May, 1856, providing) additional funds, from taxation and from loans, in order to meet each year's augmentation in charge, arising from the commutation in the year for the time being, as well

as from the commutations of preceding years, of perpetuities into life annuities. In carrying out this measure of finance the additional charge for the fresh loans and taxation which have thus been called into being has been so much productive capital annihilated, in respect of the functions it would otherwise have possessed of accumulating in the trade and industry of the community.

In previously referring to this subject it was estimated that 5 per cent. constituted a fair average rate on which to ascertain the sum to be allowed for the element of interest in the life-annuity extra charge borne by the taxed public, from September, 1808, to January, 1829, and that 82,000*l.*, at simple interest, or 1,500,000*l.* at compound interest, represented the accumulated extra charge, under this head, at January, 1829. We now propose, in reviewing the whole period, to retain these figures and to continue them, from January, 1829, to March, 1855, at the reduced rate of 4 per cent. interest.

In Table M will be found the full details of the extra expense thus incurred, from year to year, indicating an aggregate outlay, from September, 1808, to March, 1855, of about 214,000*l.* at simple interest, or about 15,902,000*l.* at compound interest (25,754,000 − 9,852,000 = 15,902,000).

To the 19,445,000*l.* of money cost of redemption 15,902,000*l.*, for interest, must therefore be added, making a grand total of 35,347,000*l.* as the aggregate expense of cancelling 30,152,000*l.* of capital stock (in the period from September, 1808, to March, 1855).

The average price at which the stock transferred to the Commissioners, on account of life annuities, was ultimately redeemed, supposing the business liquidated at 31st March, 1855, was, consequently, about 117¼ per cent.

In order to estimate the actual amount of money loss to the public accurately enough for a practical purpose, all that remains, in continuation of our enquiry, is to ascertain the prices at which the capital stocks producing perpetual interest were transferred to and cancelled by the Commissioners for the Reduction of the National Debt, on each purchase from them or commutation of such stocks into life annuities, between September, 1808, and March, 1855.

We have already remarked, in the estimate as to the first period, ended January, 1829, that an average of a general character should be avoided and that Tables J and K will supply more precise data. Reference to those tables will indicate that, making all due adjustments, the aggregate price, at dates of transfer, of the stock to the Commissioners may fairly be estimated at 26,077,000*l.*, for 30,152,000*l.* of capital stock, being an approximate price of 86*l.* per 100*l.* of 3 per cent. stock, or at a rate of interest of nearly 3½*l.* per cent. for money.

On the other hand the ultimate actual price of redemption, balancing the account as at 31st March, 1855, was, as has been previously shown, 35,347,000*l.*, or about 117¼ per cent.

The net money loss to the public may, under these conditions, be estimated at the difference between the price of transfer and the price of redemption, on review, at the given date, of all previous transactions.

This difference, as at 31st March, 1855, was the excess of

35,347,000*l.* (the accrued price of redemption at that date), over 26,077,000*l.* (the aggregate transfer price applying to the whole of the life annuity transactions entered into between 1st Sept. 1808, and 31st March, 1855). Or, stating the result in other words and using the terms generally employed in making statements of the kind, instead of each 100*l.* of money placed at the disposal of the Government by purchasers of life annuities, at the average price for transfer of 86*l.* money for each 100*l.* of 3 per cent. stock, having, as was anticipated, redeemed and cancelled 116*l.* 5*s.* 7*d.* of such stock, it really only redeemed and cancelled about 85*l.* 5*s.* 8*d.* of the stock, the ultimate ruling price of the transaction being, as explained, 117¼*l.* money, instead of 86*l.* money for each 100*l.* stock.

The final result is a net adverse balance of 9,270,000*l.* loss accrued to the Government on account of life annuities granted in the 46 years and 7 months ended 31st March, 1855.

Until more exact statistics are published by the Government with the view of affording information as to the financial and mortality results of the whole period from September, 1808, distinguishing the results under the old series of annuities from those under the new series, it will not be possible accurately to define the respective apportionment of loss to each series; but that a loss has accrued, and will accrue, on *both* series, it is anticipated would be certainly proved on such Government statistics forthcoming; and that the inherent defects in the principle of the scheme of life annuities as adopted under its assumed character of a profitable sinking fund, would also be shown, scarcely admits of a doubt.

The same remarks apply to the principles of the joint scheme in connexion with the life annuity scheme, and governed under the same Acts of Parliament, by which perpetual annuities, with precisely the same object of a sinking fund, are converted into annuities for terms of years certain.

It is submitted that the experience of the last half century affords a lesson that the creation of obligatory sinking funds, whether by life annuities or terminable annuities, granted in exchange for perpetuities, has a prejudicial instead of a beneficial effect.

The granting of such life annuities and terminable annuities, and of which there are, exclusive of Long Annuities, no less than nearly 2,000,000*l.* per annum, charged on the Consolidated Fund, *i. e.*, nearly 8 per cent. of the total charge of the national debt, constitutes nothing more nor less than a business operation, and can only be carried on subject to the methods and speculative risks of business. These are speculations and risks which it is questionable whether any Government should expose itself to; and whether it be upon a large or upon a small scale, is not much to the purpose in a matter of principle. Besides which, the ordinary methods of investment necessary for the successful management of life annuity or terminable annuity business, as a business undertaking, are not possible for a Government which can only deal in its own securities. The individual who grants an annuity can meet that charge by discretionary investments, chosen in the whole field of financial and commercial enterprise. The case of the Government is quite different. It has to consider the fiscal regulations involved—the loans it may

require in approaching periods—the means and welfare of the present generation, and the care of not fixing upon it such burdens as belong in part to posterity—the recollection that such undue burdens on the present damage industrial and productive enterprises, and tend to a balance of loss of hindered capital rather than to one of profit of accumulated capital, so that posterity is in the end the sufferer, instead of the gainer. Further, there is the bounden duty of establishing as absolute a balance of equity as is possible between the national creditor on the one hand, and those who are to find the means of satisfying that national creditor on the other hand. All these are principles which admit of statistical demonstration, and are as much bound up with the considerations which should prevail in estimating the advisability of the Government annuity plan, as they are connected with the vexed question of the sinking fund.

The old principles of the sinking fund were in more or less active operation 112 years before the legislature consented to its being eradicated, as the financiers of 1828 too credulously anticipated, at once and for ever. Its vitality was too strong not to leave some offshoots still growing. These offshoots, as we have before considered, are to be discerned in the petty sinking fund created through the power conferred on the fundholder, or on any possessor of money, to commute his perpetual annuity derivable from capital stock into life or terminable annuities for long or for short periods, and thus to pledge the Government to an obligatory sinking fund at any time, at any age, and to any extent within the power of the capitalist.

But it may be urged,—"it matters little that the petty sinking fund principle has been maintained, as the great sinking fund principle was done away with—to rise no more." The answer to this is, that it matters a good deal,—for, out of infractions in the case of the petty sinking fund grow precedents for the restoration of the great sinking fund. And thus has it arisen that in a very recent Loan Act—the Act under which the loan of 16,000,000*l.* was raised in 1855—a clause was introduced, after the manner of the loans raised in the early part of the century, implying an obligatory engagement on the country to provide a fixed sinking fund of 1,000,000*l.* per annum, or $8\frac{1}{2}$ per cent., although the prospect of having to raise fresh loans to meet war expenses was immediate, and is now in process of realization. (*Vide* Clause XXII.,—being the Sinking Fund Clause,—Loan Act, 18 & 19 Vict., c. 18.)

In conclusion, it is submitted that the identity of the obligatory sinking fund principle and the principle of the Government life and terminable annuity scheme is established—that the two principles should co-exist or be abolished together—and that the discussion of the Statistical Society on the present paper (which the writer regrets is not more worthy of the space it may occupy in their printed transactions), should be conducted on the basis of that direct analogy between the two principles, for which he has endeavoured, however inadequately, to contend.

VIII.—Abstracts Nos. I. *to* IV., *with* Appendix of Tables.

Note.—*The following* Abstracts Nos. I. *to* IV., *were read to the Society.*

The tables, at full length, and with full statistical particulars for each of the years from 1808 *to* 1855, *appear in the following* Appendix *of Thirteen Tables,* A *to* N.

Abstract No. I.

Capital Stock cancelled on account of Life Annuities, including Stock purchased with Money.

Description of Stock Transferred and Cancelled.	1st Period. Sept., 1808, to Jan., 1829.	2nd Period. Sept., 1808, to Mar., 1855.
	£	£
3 per cent. Stock	10,498,000	24,724,000
3¼ ,, ,,	Nil.	808,000
3½ ,, ,,	53,000	3,737,000
4 ,, ,,	253,000	306,000
5 ,, ,,	115,000	119,000
Total Capital Stocks	10,919,000	29,694,000
Add,—Long Annuities equivalent in 3 per cent. Stock to	448,000	458,000
Grand Totals of Capital Stock transferred and cancelled, as at end of each period	11,367,000	30,152,000

Abstract No. II.

Government Life Annuities Granted, Expired, and Outstanding, to January, 1829, *and March,* 1855.

	1st Period. Sept., 1808, to Jan., 1829.	2nd Period. Sept., 1808, to Mar., 1855.
	£	£
(Immediate) Total Life Annuities granted	870,000	2,718,000
Deduct, Do. expired	238,000	1,681,000
Remainder—Do. outstanding	632,000	1,037,000
(Deferred) Total outstanding	13,000	30,000
Total outstanding *annual* charge on Consolidated Fund on account of Life Annuities	645,000	1,067,000

ABSTRACT No. III.

Cash Payments in Excess under Life Annuities, as compared with the Payments which would have been made under Perpetual Annuities cancelled.—(*September*, 1808, *to March*, 1855.)

	1st Period. Sept., 1808, to Jan., 1829.	2nd Period. Sept., 1808, to Mar., 1855.
	£	£
Accumulated amount, without interest, of Perpetual Annuities on Capital Stocks transferred and cancelled on account of Life Annuities	3,308,000	19,348,000
Accumulated amount, without interest, of payments under Life Annuities granted in exchange for such Perpetual Annuities	6,568,000	29,199,000
Accumulated amount, without interest, of the extra payments under the Life Annuity charge at end of each period	3,260,000	9,851,000

ABSTRACT No. IV.

Table showing the Net Loss to the Government on Life Annuity Transactions.

	1st Period. Sept., 1808, to Jan., 1829.	2nd Period. Sept., 1808, to Mar., 1855.
1. Grand Total of Capital Stock transferred and cancelled at end of each period	£ 11,367,000	£ 30,152,000
2. Accumulated amount in Money Payments of excess of Life Annuity charge over Perpetual Annuity charge	3,260,000	9,851,000
3. Interest on ditto	1,500,000 (at 5 per cent.)	15,902,000 (at 5 per cent. 1808-1829) (at 4 per cent. 1829-1855)
4. Liability under outstanding Life Annuities at end of each period	7,095,000	9,594,000
5. Grand Total of ultimate Cost of Stock transferred and cancelled as at end of each period	11,855,000	35,347,000
6. Grand Total of Value, as at dates of Transfer of Stock, transferred and cancelled in each period	8,731,000	26,077,000
7. Difference between value at transfer and ultimate cost.—(NET LOSS TO THE GOVERNMENT)	3,124,000	9,270,000
8. Value of each 100*l.* of 3 per cent. Stock as at dates of Transfer	75	86
9. Value of each 100*l.* of 3 per cent. Stock in ultimate cost as at end of each period	104¼	117¼

Table A. Years 1808—1829.

Rates of Government Life Annuity, (*same rates for Male or Female Nominees,*) *under the various Acts in force between September*, 1808, *and January*, 1829.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
Age last Birthday.	When the Price of Stock is 50 and under 51; or Interest of Money is £6 Per Cent.		When the Price of Stock is 54 and under 55; or Interest of Money is £5½ Per Cent.		When the Price of Stock is 60 and under 61; or Interest of Money is £5 Per Cent.		When the Price of Stock is 66 and under 67; or Interest of Money is £4½ Per Cent.		When the Price of Stock is 75 and under 76; or Interest of Money is £4 Per Cent.		When the Price of Stock is 80 to 81, or any higher Price, and Rate of Interest £3¾ Per Cent., or lower.	
	Rate of Annuity for £100 Stock.	Average Rate for £100 Money.	Rate of Annuity for £100 Stock.	Average Rate for £100 Money.	Rate of Annuity for £100 Stock.	Average Rate for £100 Money.	Rate of Annuity for £100 Stock.	Average Rate for £100 Money.	Rate of Annuity for £100 Stock.	Average Rate for £100 Money	Rate of Annuity for £100 Stock.	Average Rate for £100 Money.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
25	3 19 .	7 16 5	4 1 .	7 8 7	4 5 .	7 . 5	4 8 .	6 12 3	4 14 .	6 4 6	4 17 .	6 0 5
30	4 2 .	8 2 4	4 4 .	7 14 1	4 8 .	7 5 5	4 12 .	6 18 4	4 18 .	6 9 9	5 1 .	6 5 5
35	4 5 .	8 8 3	4 8 .	8 1 5	4 12 .	7 12 1	4 16 .	7 4 4	5 3 .	6 16 .	5 6 .	6 11 8
40	4 9 .	8 16 2	4 12 .	8 8 9	4 17 .	8 . 4	5 2 .	7 13 5	5 9 .	7 4 4	5 13 .	7 . 4
45	4 14 .	9 6 1	4 17 .	8 17 11	5 3 .	8 10 3	5 9 .	8 3 11	5 17 .	7 15 .	6 2 .	7 11 7
50	5 2 .	10 1 11	5 6 .	9 14 5	5 12 .	9 5 1	5 18 .	8 17 5	6 8 .	8 9 6	6 13 .	8 5 3
55	5 10 .	10 17 9	5 15 .	10 11 .	6 2 .	10 1 8	6 10 .	9 15 6	7 1 .	9 6 9	7 7 .	9 2 7
60	6 . .	11 17 7	6 6 .	11 11 2	6 15 .	11 3 2	7 4 .	10 16 6	7 18 .	10 9 3	8 5 .	10 5 .
65	6 16 .	13 9 3	7 3 .	13 2 4	7 14 .	12 14 7	8 5 .	12 8 1	9 2 .	12 1 1	9 11 .	11 17 3
70	8 1 .	15 18 9	8 10 .	15 11 11	9 4 .	15 4 1	9 18 .	14 17 9	10 19 .	14 10 1	11 11 .	14 6 11
75 to 80 and upwards.	10 . .	19 16 0	10 12 .	19 8 11	11 11 .	19 1 10	12 10 .	18 15 11	13 18 .	18 8 2	14 13 .	18 4 .

Table B.

Comparative Table of Profit *and* Loss Per Cent. *on Single Life Annuities granted according to the Scale in use by the British Government, between 2nd July,* 1808, *and 9th May,* 1823, *such Profit and Loss being estimated according to the Values of Annuities at Corresponding Ages and Rates of Interest, and at the Rate of Mortality indicated by De Parcieux's observations.*

1.	2.			3.			4.			5.			6.		
Age.	When the Price of 3 Per Cent. Stock is 50 and under 51; or reckoning Interest at £6 Per Cent.			When the Price of 3 Per Cent. Stock is 54 and under 55; or reckoning Interest at £5½ Per Cent.			When the Price of 3 Per Cent. Stock is 60 and under 61; or reckoning Interest at £5 Per Cent.			When the Price of 3 Per Cent. Stock is 66 and under 67; or reckoning Interest at £4½ Per Cent.			When the Price of 3 Per Cent. Stock is 75 and under 76; or reckoning Interest at £4 Per Cent.		
	Loss Per Cent. (upon each £100 Money.)			Loss Per Cent. (upon each £100 Money.)			Loss Per Cent. (upon each £100 Money.)			Loss Per Cent. (upon each £100 Money).			Loss Per Cent. (upon each £100 Money.)		
	£ s. d.	Or, in Decimals.		£ s. d.	Or, in Decimals.		£ s. d.	Or, in Decimals.		£ s. d.	Or, in Decimals.		£ s. d.	Or, in Decimals.	
35	8 17 4	8·87		10 15 9	10·79		10 4 4	10·22		11 3 9	11·19		12 . .	12·00	
40	9 5 4	9·27		10 10 2*	10·51		9 5 7	9·28		11 18 9	11·94		11 14 2	11·71	
45	8 5 7	8·28		8 16 4	8·82		9 4 2	9·21		10 15 .	10·75		10 10 7	10·53	
50	8 5 .	8·25		9 . 9	9·04		8 8 9	8·44		8 19 2	8·96		9 6 .	9·30	
55	6 13 .	6·65		7 12 .	7·60		7 . .	7·00		8 3 7	8·18		7 18 4	7·92	
60	3 18 .	3·90		4 14 2	4·71		4 15 .	4·75		5 8 7	5·43		5 16 2	5·81	
65	. 9 .	0·45		. 16 9	0·84		. 18 8	0·93		1 11 6	1·57		1 18 4	1·92	
	Gain Per Cent. (upon each £100 Money.)			Gain Per Cent. (upon each £100 Money.)			Gain Per Cent. (upon each £100 Money.)			Gain Per Cent. (upon each £100 Money.)			Gain Per Cent. (upon each £100 Money.)		
70	2 4 .	2·20		1 17 9	1·89		1 11 3	1·56		1 1 2	1·06		1 . 3	1·01	
75	2 7 5	2·37		2 3 5	2·17		1 7 4	1·37		. 15 11	0·80		. 15 .	0·75	
Above 75	+	+		+	+		+	+		+	+		+	+	

* The loss added to, or the gain subtracted from, 100*l.* money, represents the value, according to the conditions above stated, of the Annuity granted by Government for each 100*l.* money.

Example No. 1. The sum of 10*l.* 10*s.* 2*d.*, found in the third column of the Table, in the line with age 40, and under the head 5½ Per Cent. calculations, added to 100*l.*, gives 110*l.* 10*s.* 2*d.* for the value of the Annuity 8*l.* 8*s.* 9*d.*, granted by the Government for each 100*l.* money, (the average proportionate Annuity for 100*l.* Stock, at price of 54 to 55, being 4*l.* 12*s.*, as per Table A, *ante*, col. 4.

Example No. 2. The sum of 2*l.* 3*s.* 5*d.* subtracted from 100*l.*, leaves 97*l.* 16*s.* 7*d.* for the value of the Annuity, 19*l.* 8*s.* 11*d.*, granted by

TABLE C. YEARS 1829—1855.

RATES *of* GOVERNMENT LIFE ANNUITY (different rates for Male and Female Nominees,) *under the Acts in force between January, 1829, and March, 1855.*

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
Age last Birthday.	When the Price of Stock is 80, or Rate of Interest 3¾ Per Cent.		When the Price of Stock is 85, or Rate of Interest £3 11*s.* Per Cent.		When the Price of Stock is 90, or Rate of Interest £3 7*s.* Per Cent.		When the Price of Stock is 100, or Rate of Interest £3 Per Cent.		When the Price of Stock is £102 11*s.* 3*d.*, and under £104 6*s.* 11*d.*, the Rate of Interest being £2 18*s.* Per Cent.	
	Rate of Annuity for £100 Stock.	Rate of Annuity for £100 Stock.	Rate of Annuity for £100 Stock.	Rate or Annuity for £100 Stock.	Rate of Annuity for £100 Stock	Rate of Annuity for £100 Stock.	Rate of Annuity for £100 Stock.	Rate of Annuity for £100 Stock.	Rate of Annuity for £100 Stock.	Rate of Annuity for £100 Stock.
	Male Lives.	Female Lives.	Male Lives.	Female Lives.	Male Lives.	Female Lives.	Male Lives.	Female Lives.	Male Lives.	Female Lives.
	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*
15	4 4 8	3 19 10	4 6 6	4 1 5	4 8 7	4 3 2	4 13 .	4 6 11	4 14 5	4 8 2
20	4 8 3	4 1 10	4 10 3	4 3 7	4 12 7	4 5 6	4 17 5	4 9 7	4 19 .	4 11 .
25	4 10 2	4 4 2	4 12 4	4 6 .	4 14 11	4 8 2	5 . 2	4 12 8	5 1 11	4 14 2
30	4 13 .	4 7 .	4 15 5	4 9 2	4 18 2	4 11 6	5 4 .	4 16 6	5 5 11	4 18 2
35	4 17 3	4 10 7	5 . .	4 12 11	5 3 1	4 15 7	5 9 6	5 1 2	5 11 8	5 3 .
40	5 3 1	4 14 9	5 6 2	4 17 5	5 9 8	5 . 5	5 17 .	5 6 8	5 19 6	5 8 9
50	6 3 6	5 8 5	6 7 10	5 11 11	6 12 8	5 15 10	7 2 8	6 4 1	7 6 .	6 6 10
60	7 17 10	6 16 5	8 4 .	7 1 6	8 11 .	7 7 3	9 5 6	7 19 2	9 10 4	8 3 2
65	9 6 4	8 . 3	9 14 1	8 6 8	10 2 10	8 13 10	11 1 .	9 8 9	11 7 .	9 13 9
70	11 5 1	9 14 8	11 15 1	10 3 .	12 6 2	10 12 3	13 9 4	11 11 6	13 16 11	11 17 10
75	14 . 1	12 2 11	14 13 2	12 13 10	15 7 9	13 6 .	16 18 .	14 11 3	17 8 .	14 19 8
80 and upwards	19 11 5	15 5 10	20 10 7	16 . 2	21 12 1	16 16 3	23 16 6	18 9 7	24 11 2	19 . 7

Note.—With regard to columns 10 and 11 it is observable that their publication was discontinued, and new tables were issued in February, 1853, making the *maximum* Annuity Rates stop when the price of Stock is at or above 99*l.* 3*s.* 6*d.* The rates applicable to the price last mentioned are the same as in the above columns 8 and 9.

TABLE D.—PART I. *Years* 1808—1829.

STATEMENT *for each Year of the* TOTAL AMOUNT *of* CAPITAL STOCKS *and* LONG ANNUITY TRANSFERRED *to, and Cancelled by, the Commissioners for the Reduction of the National Debt, on Account of Life Annuities.*

DATES.	3 PER CENT. Capital Stock Transferred and Cancelled, including Stock purchased with Money in each Year.	3¼ PER CENT. Capital Stock Transferred and Cancelled in each Year.	3½ PER CENT. Capital Stock Transferred and Cancelled in each Year.	4 PER CENT. Capital Stock Transferred and Cancelled in each Year.	5 PER CENT. Capital Stock Transferred and Cancelled in each Year.	TOTAL CAPITAL STOCKS of all Denominations, Transferred and Cancelled, in each Year.	LONG ANNUITIES Expiring in 1860, Transferred and Cancelled in each Year.
	£	£	£	£	£	£	£
From 1 Sept. 1808, to 31 Jan. 1809	465,951	.....	.....	.....	.....	465,951	.....
Year ended 31 January, 1810	558,561	.....	.....	.....	.....	558,561	.....
,, ,, 1811	290,777	.....	.....	.....	.....	290,777	.....
,, ,, 1812	290,751	.....	.....	.....	.....	290,751	.....
,, ,, 1813	355,542	.....	.....	.....	.....	355,542	.....
,, ,, 1814	400,085	.....	.....	.....	.....	400,085	.....
,, ,, 1815	433,673	.....	.....	.....	.....	433,673	.....
,, ,, 1816	302,211	.....	.....	.....	.....	302,211	.....
,, ,, 1817	352,404	.....	.....	.....	.....	352,404	4,420
From 31 Jan. 1817, to 5 Jan. 1818	841,234	.....	.....	3,824	28,372	873,430	1,300
Year ended 5 January, 1819	535,405	.....	.....	9,656	26,700	571,761	1,260
,, ,, 1820	354,857	.....	.....	12,696	14,687	382,240	779
,, ,, 1821	520,579	.....	.....	15,530	20,887	556,996	712
,, ,, 1822	498,199	.....	.....	9,928	24,006	532,133	1,366
,, ,, 1823	958,916	.....	.....	.....	.....	958,916	1,201
,, ,, 1824	702,522	.....	3,247	53,123	.....	758,892	9,006
,, ,, 1825	508,895	.....	5,515	24,764	.....	539,174	1,247
,, ,, 1826	528,205	.....	6,777	21,787	.....	556,769	619
,, ,, 1827	610,848	.....	8,325	34,430	.....	653,603	904
,, ,, 1828	594,044	.....	17,695	29,113	.....	640,852	832
,, ,, 1829	394,698	.....	11,499	38,078	.....	444,275	368
Total, 20 years and 4 months—from Sept. 1808, to Jan. 1829	10,498,357	.....	53,058	252,929	114,652	10,918,996	24,014
Annual Average—from Sept. 1808,	516,313	.....	2,609	12,438	5,638	537,000	1,181

Table D.—Part II. Years 1829—1855.

Statement *for each year of the* Total Amount *of* Capital Stocks *and* Long Annuity Transferred *to, and cancelled by, the Commissioners for the Reduction of the National Debt, on account of Life Annuities.*

Dates.	3 Per Cent. Capital Stock Transferred and Cancelled, including Stock purchased with Money in each Year.	3¼ Per Cent. Capital Stock Transferred and Cancelled in each Year.	3½ Per Cent. Capital Stock Transferred and Cancelled in each Year.	4 Per Cent. Capital Stock Transferred and Cancelled in each Year.	5 Per Cent. Capital Stock Transferred and Cancelled in each Year.	Total Capital Stocks of all Denominations Transferred and Cancelled in each Year.	Long Annuities, expiring in 1860, Transferred and Cancelled in each Year.
	£	£	£	£	£	£	£
Year ended 5 Jan., 1830	73,594	....	25,446	5,177	.....	104,217	419
,, ,, 1831	477,723	....	194,633	33,511	.....	705,867	151
,, ,, 1832	283,974	....	198,864	2,371	.....	485,209	....
,, ,, 1833	181,465	....	244,542	8,255	.....	434,262	....
,, ,, 1834	214,389	....	455,377	2,161	.....	671,927	....
,, ,, 1835	362,724	....	1,044,301	2,004	.....	1,409,029	....
,, ,, 1836	206,466	....	223,976	....	.....	430,442	....
,, ,, 1837	353,365	....	211,605	....	.....	564,970	....
,, ,, 1838	272,827	....	217,478	....	4,723	495,028	....
,, ,, 1839	527,981	....	49,102	....	.....	577,083	36
,, ,, 1840	370,048	....	185,112	....	.....	555,160	....
,, ,, 1841	378,351	....	196,902	....	.....	575,253	....
,, ,, 1842	410,633	....	113,146	....	.....	523,779	....
,, ,, 1843	480,252	....	126,770	....	.....	607,022	....
,, ,, 1844	666,345	....	151,295	....	.....	817,640	....
,, ,, 1845	1,633,386	51,934	45,042	....	.....	1,730,362	....
,, ,, 1846	703,728	162,005	....	....	.....	865,733	....
,, ,, 1847	521,663	164,835	....	....	.....	686,498	....
,, ,, 1848	414,640	35,575	....	....	.....	450,215	....
,, ,, 1849	459,097	28,982	....	....	.....	488,079	....
,, ,, 1850	602,634	67,225	....	....	.....	669,859	....
,, ,, 1851	1,204,412	88,087	....	....	.....	1,292,499	....
,, ,, 1852	802,249	52,012	....	....	.....	854,261	....
,, ,, 1853	1,296,150	119,111	....	....	.....	1,415,261	....
From 5 Jan., 1853, to 5 April, 1854.....	871,087	14,467	....	....	.....	885,354	....
From 5 April, 1854, to 31 March, 1855	456,830	23,395	....	....	.....	480,225	....
Total 26 years and 3 months, from Jan., 1829, to March, 1855	14,226,013	807,628	3,683,591	53,479	4,723	18,775,434	606
Annual average from January, 1829, to March, 1855	541,943	30,767	140,327	2,037	180	715,254	23
Total 46 years and 7 months, from Sept., 1808, to March, 1855	24,724,370	807,628	3,736,649	306,408	119,375	29,694,430	24,620
Annual average from September, 1808, to March, 1855	529,809	17,337	80,214	6,577	2,562	637,448	529

TABLE E.—PART I. YEARS 1808—1829.

Statement from 1808, *down to separate dates of each subsequent year, of the* AGGREGATE TOTAL AMOUNTS *of* CAPITAL STOCKS TRANSFERRED *to, and Cancelled by, the Commissioners for the Reduction of the National Debt, on account of Life Annuities.*

DATES.	Aggregate Totals, from Sept., 1808, of 3 Per Cent. Capital Stocks Transferred and Cancelled, including Stocks purchased with Money.	Aggregate Totals, from Sept., 1808, of 3¼ Per Cent. Capital Stock Transferred and Cancelled.	Aggregate Totals, from Sept., 1808, of 3½ Per Cent. Capital Stock Transferred and Cancelled.	Aggregate Totals, from Sept., 1808, of 4 Per Cent. Capital Stock Transferred and Cancelled.	Aggregate Totals, from Sept., 1808, of 5 Per Cent. Capital Stock Transferred and Cancelled.	Aggregate Totals, from Sept., 1808, of Capital Stock of all Denominations, Transferred and Cancelled.	Supplementary Column. — Aggregate Totals of Long Annuity Transferred and Cancelled.
	£	£	£	£	£	£	£
From 1 Sept. 1808, to 31 Jan. 1809	465,951	.....	.....	.....	.....	465,951	.....
Year ended 31 January, 1810	1,024,512	.....	.....	.....	.....	1,024,512	.....
,, ,, 1811	1,315,289	.....	.....	.....	.....	1,315,289	.....
,, ,, 1812	1,606,040	.....	.....	.....	.....	1,606,040	.....
,, ,, 1813	1,961,582	.....	.....	.....	.....	1,961,582	.....
,, ,, 1814	2,361,667	.....	.....	.....	.....	2,361,667	.....
,, ,, 1815	2,795,340	.....	.....	.....	.....	2,795,340	.....
,, ,, 1816	3,097,551	.....	.....	.....	.....	3,097,551	.....
,, ,, 1817	3,449,955	.....	.....	.....	.....	3,449,955	4,420
From 31 Jan. 1817, to 5 Jan. 1818	4,291,189	.....	.....	3,824	28,372	4,323,385	5,720
Year ended 5 January, 1819	4,826,594	.....	.....	13,480	55,072	4,895,146	6,980
,, ,, 1820	5,181,451	.....	.....	26,176	69,759	5,277,386	7,759
,, ,, 1821	5,702,030	.....	.....	41,706	90,646	5,834,382	8,471
,, ,, 1822	6,200,229	.....	.....	51,634	114,652	6,366,515	9,837
,, ,, 1823	7,159,145	.....	.....	51,634	114,652	7,325,431	11,038
,, ,, 1824	7,861,667	.....	3,247	104,757	114,652	8,084,323	20,044
,, ,, 1825	8,370,562	.....	8,762	129,521	114,652	8,623,497	21,291
,, ,, 1826	8,898,767	.....	15,539	151,308	114,652	9,180,266	21,910
,, ,, 1827	9,509,615	.....	23,864	185,738	114,652	9,833,869	22,814
,, ,, 1828	10,103,659	.....	41,559	214,851	114,652	10,474,721	23,646
,, ,, 1829	10,498,357	.....	53,058	252,929	114,652	10,918,996	24,014

TABLE E.—PART II. YEARS 1829—1855.

Statement from 1808, *down to separate dates of each subsequent year, of the* AGGREGATE TOTAL AMOUNTS *of* CAPITAL STOCKS TRANSFERRED *to, and Cancelled by, the Commissioners for the Reduction of the National Debt, on account of Life Annuities.*

DATES.	Aggregate Totals, from Sept., 1808, of 3 Per Cent. Capital Stocks Transferred and Cancelled, including Stock purchased with Money.	Aggregate Totals, from Sept., 1808, of 3¼ Per Cent. Capital Stock Transferred and Cancelled.	Aggregate Totals, from Sept., 1808, of 3½ Per Cent. Capital Stock Transferred and Cancelled.	Aggregate Totals, from Sept., 1808, of 4 Per Cent. Capital Stock Transferred and Cancelled.	Aggregate Totals, from Sept., 1808, of 5 Per Cent. Capital Stock Transferred and Cancelled.	Aggregate Totals, from Sept., 1808, of Capital Stock of all Denominations, Transferred and Cancelled.	Supplementary Column. — Aggregate Totals, from Sept., 1808, of Long Annuities Transferred and Cancelled.
	£	£	£	£	£	£	£
Year ended 5 January, 1830	10,571,951	.....	78,504	258,106	114,652	11,023,213	24,433
,, ,, 1831	11,049,674	.....	273,137	291,617	114,652	11,729,080	24,584
,, ,, 1832	11,333,648	.....	472,001	293,988	114,652	12,214,289	24,584
,, ,, 1833	11,515,113	.....	716,543	302,243	114,652	12,648,551	24,584
,, ,, 1834	11,729,502	.....	1,171,920	304,404	114,652	13,320,478	24,584
,, ,, 1835	12,092,226	.....	2,216,221	306,408	114,652	14,729,507	24,584
,, ,, 1836	12,298,692	.....	2,440,197	306,408	114,652	15,159,949	24,584
,, ,, 1837	12,652,057	.....	2,651,802	306,408	114,652	15,724,919	24,584
,, ,, 1838	12,924,884	.....	2,869,280	306,408	119,375	16,219,947	24,584
,, ,, 1839	13,452,865	.....	2,918,382	306,408	119,375	16,797,030	24,620
,, ,, 1840	13,822,913	.....	3,103,494	306,408	119,375	17,352,190	24,620
,, ,, 1841	14,201,264	.....	3,300,396	306,408	119,375	17,927,443	24,620
,, ,, 1842	14,611,897	.....	3,413,542	306,408	119,375	18,451,222	24,620
,, ,, 1843	15,092,149	.....	3,540,312	306,408	119,375	19,058,244	24,620
,, ,, 1844	15,758,494	.....	3,691,607	306,408	119,375	19,875,884	24,620
,, ,, 1845	17,391,880	51,934	3,736,649	306,408	119,375	21,606,246	24,620
,, ,, 1846	18,095,608	213,939	3,736,649	306,408	119,375	22,471,979	24,620
,, ,, 1847	18,617,271	378,774	3,736,649	306,408	119,375	23,158,477	24,620
,, ,, 1848	19,031,911	414,349	3,736,649	306,408	119,375	23,608,692	24,620
,, ,, 1849	19,491,008	443,331	3,736,649	306,408	119,375	24,096,771	24,620
,, ,, 1850	20,093,642	510,556	3,736,649	306,408	119,375	24,766,630	24,620
,, ,, 1851	21,298,054	598,643	3,736,649	306,408	119,375	26,059,129	24,620
,, ,, 1852	22,100,303	650,655	3,736,649	306,408	119,375	26,913,390	24,620
,, ,, 1853	23,396,453	769,766	3,736,649	306,408	119,375	28,328,651	24,620
From 5 Jan. 1853, to 5 April, 1854	24,267,540	784,233	3,736,649	306,408	119,375	29,214,205	24,620
From 5 April, 1854, to 31 March, 1855	24,724,370	807,628	3,736,649	306,408	119,375	29,694,430	24,620

Table F.—Part I. Years 1808—1829.

Statement of Perpetual Annuities Transferred *to, and Cancelled by, the Commissioners for the Reduction of the National Debt on account of Life Annuities, being Interest on Capital Stocks of all Denominations.*

1. Dates.	2. Interest on 3 Per Cent. Capital Stock, Transferred and Cancelled, including Stock purchased with Money in each Year.	3. Interest on 3¼ Per Cent. Capital Stock, Transferred and Cancelled.	4. Interest on 3½ Per Cent. Capital Stock, Transferred and Cancelled.	5. Interest on 4 Per Cent. Capital Stock, Transferred and Cancelled.	6. Interest on 5 Per Cent. Capital Stock, Transferred and Cancelled.	7. Total Interest on Capital Stock of all Denominations Transferred and Cancelled.	8. Supplementary Column. — Total Interest on Long Annuities Transferred and Cancelled.
	£	£	£	£	£	£	£
From 1 Sept. 1808, to 31 Jan. 1809	13,978	.....	.....	.....	.....	13,978	.....
Year ended 31 January, 1810	16,757	.....	.....	.....	.....	16,757	.....
,, ,, 1811	8,723	.....	.....	.....	.....	8,723	.....
,, ,, 1812	8,723	.....	.....	.....	.....	8,723	.....
,, ,, 1813	10,666	.....	.....	.....	.....	10,666	.....
,, ,, 1814	12,003	.....	.....	.....	.....	12,003	.....
,, ,, 1815	13,010	.....	.....	.....	.....	13,010	.....
,, ,, 1816	9,066	.....	.....	.....	.....	9,066	.....
,, ,, 1817	10,572	.....	.....	.....	.....	10,572	4,420
From 31 Jan. 1817, to 5 Jan. 1818	25,237	.....	.....	153	1,419	26,809	1,300
Year ended 5 January, 1819	16,062	.....	.....	386	1,335	17,783	1,260
,, ,, 1820	10,646	.....	.....	508	735	11,888	779
,, ,, 1821	15,618	.....	.....	621	1,044	17,283	712
,, ,, 1822	14,946	.....	.....	397	1,201	16,545	1,366
,, ,, 1823	28,767	.....	.....	4,587	.....	27,620	1,201
,, ,, 1824	21,075	.....	114	2,125	.....	23,314	9,006
,, ,, 1825	15,267	.....	193	990	.....	16,450	1,247
,, ,, 1826	15,846	.....	237	871	.....	16,954	619
,, ,, 1827	18,326	.....	291	1,377	.....	19,994	904
,, ,, 1828	17,821	.....	619	1,165	.....	19,605	832
,, ,, 1829	11,841	.....	402	1,523	.....	13,766	368
Total, 20 years and 4 months—from Sept. 1808, to Jan. 1829	314,950	.....	1,856	14,703	Merged into 4 Per Cents (Col. 5,) by reduction of Interest.	331,509	24,014
Annual Average—from Sept. 1808, to Jan. 1829	15,490	.....	.....	.....	.....	16,310	.....

Table F.—Part II. Years 1829—1855.

atement of Perpetual Annuities Transferred to, *and cancelled by, the Commissioners for the Reduction of the National Debt, on account of Life Annuities, being Interest on Capital Stocks of all denominations.*

1. Date.	2. Interest on 3 Per Cent. Capital Stock Transferred and Cancelled, including Stock purchased with Money, in each Year.	3. Interest on 3¼ Per Cent. Capital Stock Transferred and Cancelled.	4. Interest on 3½ Per Cent. Capital Stock Transferred and Cancelled.	5. Interest on 4 Per Cent. Capital Stock Transferred and Cancelled.	6. Interest on 5 Per Cent. Capital Stock Transferred and Cancelled.	7. Total Interest on Capital Stock of all Denominations Transferred and Cancelled.	8. Supplementary Column. Total Interest on Long Annuities Transferred and Cancelled.
	£	£	£	£	£	£	£
ear ended 5 Jan., 1830	2,208	....	891	206	....	3,305	419
,, ,, 1831	14,332	....	19,858	1,340	....	20,621	151
,, ,, 1832	8,519	....	6,960	95	....	15,574	....
,, ,, 1833	5,444	....	8,559	330	....	14,333	....
,, ,, 1834	6,432	....	15,938	86	....	22,456	....
,, ,, 1835	10,882	....	38,240	80	....	47,271	....
,, ,, 1836	6,194	....	7,839	....	....	14,033	....
,, ,, 1837	10,601	....	7,406	....	....	18,007	....
,, ,, 1838	8,185	....	7,612	....	236	16,033	....
,, ,, 1839	15,839	....	1,719	....	....	17,558	36
,, ,, 1840	11,101	....	6,479	....	....	17,580	....
,, ,, 1841	11,350	....	6,892	....	....	18,242	....
,, ,, 1842	12,319	....	3,960	....	....	16,279	....
,, ,, 1843	14,408	....	4,437	....	....	18,845	....
,, ,, 1844	19,990	....	5,295	....	....	25,285	....
,, ,, 1845	49,002	136,811	1,576	....	....	41,872	....
,, ,, 1846	21,112	5,265	....	....	....	26,377	....
,, ,, 1847	15,650	5,357	....	....	....	21,007	....
,, ,, 1848	12,440	1,155	....	....	....	13,595	....
,, ,, 1849	13,773	942	....	....	....	14,715	....
,, ,, 1850	18,079	2,185	....	....	....	20,264	....
,, ,, 1851	36,132	2,863	....	....	....	38,995	....
,, ,, 1852	24,068	1,690	....	....	....	25,758	....
,, ,, 1853	38,885	3,871	....	....	....	42,756	....
rom 5 Jan., 1853, to 5 April, 1854	26,132	470	....	....	....	26,602	....
rom 5 April, 1854, to 31 March, 1855	162,641	760	....	....	....	2,032	....
otal 26 years and 3 months, from Jan., 1829, to March, 1855	575,718	Finally merged into Col. 2, (or 3 Per Cents,) by reductions of Interest. *Vide* Foot Notes to Table G., post, Parts I. and II. N.B.—Net reductions allowed for in Col. 7 of Tables F. and G., Parts II.			236	559,395	606
nnual average from January, 1829, to March, 1855	21,930	....	....	....	....	21,310	....
otal 46 years and 7 months, from Sept., 1808, to March, 1855	890,668	*Vide* the above note.			236	890,904	24,620
nnual average from September, 1808, to March, 1855	19,120	....	....	....	....	19,125	....

Table G.—Part I. Years 1808—1829.

Statement from 1808 *down to separate dates of each year, of the* Aggregate Amount *of* Perpetual Annuities Transferred *to, and Cancelled by, the Commissioners for the Reduction of the National Debt, on account of Life Annuities, being Interest on Capital Stocks of all Denominations, as per Table* E.

1. Dates.	2. Aggregate Totals, from Sept., 1808, of Interest on 3 Per Cents.	3. Aggregate Totals, from Sept., 1808, of Interest on 3¼ Per Cents.	4. Aggregate Totals, from Sept., 1808, of Interest on 3½ Per Cents.	5. Aggregate Totals, from Sept., 1808, of Interest on 4 Per Cents.	6. Aggregate Totals, from Sept., 1808, of Interest on 5 Per Cents.	7. Aggregate Totals, from Sept., 1808, of Interest on Capital Stocks of all Denominations.	8. Supmntry. Col. — Aggregate Totals, from Sept., 1808, of Interest on Long Annuities.
	£	£	£	£	£	£	£
From 1 Sept. 1808, to 31 Jan. 1809	13,978	.....	.....	.....	.....	13,978	.....
Year ended 31 January, 1810	30,735	.....	.....	.....	.....	30,735	.....
,, ,, 1811	39,458	.....	.....	.....	.....	39,458	.....
,, ,, 1812	48,181	.....	.....	.....	.....	48,181	.....
,, ,, 1813	58,847	.....	.....	.....	.....	58,847	.....
,, ,, 1814	70,850	.....	.....	.....	.....	70,850	.....
,, ,, 1815	83,860	.....	.....	.....	.....	83,860	.....
,, ,, 1816	92,926	.....	.....	.....	.....	92,926	.....
,, ,, 1817	103,498	.....	.....	.....	.....	103,498	4,420
From 31 Jan. 1817, to 5 Jan. 1818	128,735	.....	.....	153	1,419	130,307	5,720
Year ended 5 January, 1819	144,797	.....	.....	539	2,754	148,090	6,980
,, ,, 1820	155,443	.....	.....	1,047	3,489	159,978	7,759
,, ,, 1821	171,061	.....	.....	1,668	4,533	177,261	8,471
,, ,, 1822	186,007	.....	.....	2,065	5,734*	193,806	9,837
,, ,, 1823	214,774	.....	.....	6,652	.....	221,426	11,038
,, ,, 1824	235,849	.....	114	8,777	.....	244,740	20,044
,, ,, 1825	251,116	.....	307	9,767	.....	261,190	21,291
,, ,, 1826	266,962	.....	544	10,638	.....	278,144	21,910
,, ,, 1827	285,288	.....	835	12,015	.....	298,138	22,814
,, ,, 1828	303,109	.....	1,454	13,180	.....	317,743	23,646
,, ,, 1829	314,950	.....	1,856	14,703	.....	331,509	24,014
Aggregate Total, 20 years* and 4 months—from Sept. 1808, to Jan. 1829	314,950	.....	1,856	14,703	.....*	331,509	24,014

* 5 Per Cents reduced to 4 Per Cents (3 Geo. IV., c. 9). Total reduced interest transferred to 4 Per Cent. column.

Statement from 1808 *down to separate dates of each year, of the* AGGREGATE AMOUNT *of* PERPETUAL ANNUITIES TRANSFERRED *to, and Cancelled by, the Commissioners for the Reduction of the National Debt, on account of Life Annuities, being Interest on Capital Stocks of all Denominations, as per Table* E.

1. Dates.	2. Aggregate Totals, from Sept., 1808, of Interest on 3 Per Cents.	3. Aggregate Totals, from Sept., 1808, of Interest on 3¼ Per Cents.	4. Aggregate Totals, from Sept., 1808, of Interest on 3½ Per Cents.	5. Aggregate Totals, from Sept., 1808, of Interest on 4 Per Cents.	6. Aggregate Totals, from Sept., 1808, of Interest on 5 Per Cents.	7. Aggregate Totals, from Sept., 1808, of Interests on Capital Stocks of all Denominations.	8. Supmntry. Col. — Aggregate Totals from Sept., 1808, of Interest on Long Annuities.
	£	£	£	£	£	£	£
Year ended 5 January, 1830	317,158	.....	2,747	14,909	.....	334,814	24,433
,, ,, 1831	331,490	.....	22,605	1,340	.....	355,435	24,584
,, ,, 1832	340,009	.....	29,565	1,435	.....	371,009	24,584
,, ,, 1833	345,453	.....	38,124	1,765	.....	385,342	54,584
,, ,, 1834	351,885	.....	54,062	1,851	.....	407,798	54,584
,, ,, 1835	362,767	.....	92,302	1,931‡	.....	455,069	54,584
,, ,, 1836	368,961	.....	100,141	.....	.....	469,102	54,584
,, ,, 1837	379,562	.....	107,547	.....	.....	487,109	54,584
,, ,, 1838	387,747	.....	115,159	.....	236	503,142	54,524
,, ,, 1839	403,586	.....	116,878	.....	236	520,700	24,620
,, ,, 1840	414,687	.....	123,357	.....	236	538,280	24,620
,, ,, 1841	426,037	.....	130,249	.....	236	556,522	24,620
,, ,, 1842	438,356	.....	134,209	.....	236	572,801	24,620
,, ,, 1843	452,764	.....	138,646	.....	236	591,646	24,620
,, ,, 1844	472,754	.....	143,941	.....	236	616,931	24,620
,, ,, 1845	521,756	136,811	145,517†	.....	236	658,803	24,620
,, ,, 1846	542,868	142,076	.....	.....	236	685,180	24,620
,, ,, 1847	558,518	147,433	.....	.....	236	706,187	24,600
,, ,, 1848	570,958	148,588	.....	.....	236	719,782	24,620
,, ,, 1849	584,731	149,530	.....	.....	236	734,497	24,620
,, ,, 1850	602,810	151,715	.....	.....	236	754,761	24,620
,, ,, 1851	638,942	154,758	.....	.....	236	793,756	24,620
,, ,, 1852	663,010	156,268	.....	.....	236	819,514	24,620
,, ,, 1853	701,895	160,139	.....	.....	236	862,270	24,620
From 5 Jan. 1853, to 5 April, 1854	728,027	160,609	.....	.....	236	888,872	24,620
From 5 April, 1854, to 31 March, 1855	890,668	161,369*	.....	.....	236	890,904	24,620

* 3¼ Per Cents reduced to New 3 Per Cents, (7 Vict., c. 4 and 5). Total reduced Interest transferred to 3 Per Cent. Column, (No. 2,) and allowed for in column of Aggregate Totals from Sept. 1808, of Interest on Capital Stocks of all denominations.

† 3½ Per Cents reduced to 3¼ Per Cents, (7 Vict. c. 4 and 5). Total reduced Interest transferred to 3¼ Per Cent. column, and allowed for as above.

‡ 4 Per Cents of 1826 reduced to 3½ Per Cents, (4 & 5 Will. IV., c. 31). Total reduced Interest transferred to 3½ Per Cent. column, and allowed for as above.

Table H. Years 1808—1855.

General Statistical Abstract of Government Annuities for Lives, Granted, Expired, and Outstanding, at Separate Financial Periods between 1st September, 1808, and 31st March, 1855.

1. Dates and Periods.	2. Total Annuities for Lives granted *in each* of the periods the dates of which are given in preceding column.	3. Aggregate Totals from 1 Sept., 1808, to end of each period, of Life Annuities granted.	4. Total Annuities for Lives Expired in each Period.	5. Aggregate Totals from 1 Sept., 1808, to end of each period, of Life Annuities expired.	6. Annual Balances of Increase.	7. Annual Balances of Decrease.	8. Outstanding Annual Charge for Life Annuities in existence at each of the undermentioned dates.
(Part I., 1808—1829.)	£	£	£	£	£	£	£
From 1 Sept., 1808, to 31 Jan., 1809	32,514	32,514	....	....	32,514	....	31 January, 1809.... 32,514
Year ended 31 January, 1810	39,571	72,085	344	344	39,227	....	,, 1810.... 71,741
,, ,, 1811	20,780	92,865	978	1,322	19,802	....	,, 1811.... 91,543
,, ,, 1812	21,858	114,723	975	2,297	20,883	....	,, 1812.... 112,426
,, ,, 1813	25,608	140,331	2,362	4,659	23,246	....	,, 1813.... 135,672
,, ,, 1814	27,270	167,601	4,257	8,916	23,013	....	,, 1814.... 158,685
,, ,, 1815	31,458	199,059	4,265	13,181	27,193	....	,, 1815.... 185,878
,, ,, 1816	20,517	219,576	6,550	19,731	13,967	....	,, 1816.... 199,845
,, ,, 1817	33,213	252,789	7,804	27,535	25,409	....	,, 1817.... 225,254
From 31 Jan., 1817, to 5 Jan., 1818	69,852	322,641	6,616	34,151	63,236	....	5 January, 1818.... 288,490
Year ended 5 January, 1819	48,464	371,105	7,518	41,669	40,946	....	,, 1819.... 329,436
,, ,, 1820	31,721	402,826	9,882	51,551	21,839	....	,, 1820.... 351,275
,, ,, 1821	42,444	445,270	10,719	62,270	31,725	....	,, 1821.... 383,000
,, ,, 1822	44,618	489,888	16,653	78,923	27,965	....	,, 1822.... 410,965
,, ,, 1823	79,352	569,240	17,148	96,071	62,204	....	,, 1823.... 473,169
,, ,, 1824	71,851	641,091	25,386	121,457	46,465	....	,, 1824.... 519,634
,, ,, 1825	41,974	683,065	23,117	144,574	18,857	....	,, 1825.... 538,491
,, ,, 1826	41,537	724,602	26,083	170,657	15,454	....	,, 1826.... 553,945
,, ,, 1827	53,717	778,319	18,412	189,069	35,305	....	,, 1827.... 589,250
,, ,, 1828	54,617	832,936	26,331	215,400	28,286	....	,, 1828.... 617,536
,, ,, 1829	37,252	870,188	22,811	238,211	14,441	....	,, 1829.... 631,977
(Part II., 1829—1855.)							
Year ended 5 January, 1830	18,838	889,026	32,757	270,968	....	13,919	,, 1830.... 618,058
,, ,, 1831	84,248	973,274	32,946	303,914	51,302	....	,, 1831.... 669,360
,, ,, 1832	78,334	1,051,608	29,206	333,120	49,128	....	,, 1832.... 718,488
,, ,, 1833	43,838	1,095,446	44,798	377,918	....	960	,, 1833.... 717,528
,, ,, 1834	110,220	1,205,666	37,624	415,542	72,596	....	,, 1834.... 790,124

,, ,,	1836	37,582	1,438,887	55,444	545,254	....	17,862	,, 1850....	895,089
,, ,,	1837	49,337	1,488,224	68,740	613,994	....	19,403	,, 1837....	874,230
,, ,,	1838	44,527	1,532,751	63,376	677,370	....	18,849	,, 1838....	855,381
,, ,,	1839	48,689	1,581,440	52,353	729,723	....	3,664	,, 1839....	851,717
,, ,,	1840	49,820	1,631,260	43,205	772,928	6,615	....	,, 1840....	858,332
,, ,,	1841	50,431	1,681,691	50,908	823,836	....	477	,, 1841....	857,855
,, ,,	1842	45,736	1,727,427	62,815	886,651	....	17,079	,, 1842....	840,776
,, ,,	1843	47,870	1,775,297	62,289	948,940	....	14,419	,, 1843....	826,357
,, ,,	1844	82,741	1,858,038	67,044	1,015,984	15,697	....	,, 1844....	842,054
,, ,,	1845	168,815	2,026,853	51,314	1,067,298	117,501	....	,, 1845....	959,555
,, ,,	1846	70,199	2,097,052	66,772	1,134,070	3,427	....	,, 1846....	962,982
,, ,,	1847	62,341	2,159,393	44,818	1,178,888	17,523	....	,, 1847....	980,505
,, ,,	1848	36,586	2,195,979	120,115	1,299,003	....	83,529	,, 1848....	896,976
,, ,,	1849	40,776	2,236,755	51,714	1,350,717	....	10,938	,, 1849....	886,038
,, ,,	1850	57,484	2,294,239	42,117	1,392,834	15,367	....	,, 1850....	901,405
,, ,,	1851	119,463	2,413,702	41,725	1,434,559	77,738	....	,, 1851....	979,143
,, ,,	1852	61,096	2,474,798	54,834	1,489,393	6,262	....	,, 1852....	985,405
,, ,,	1853	128,998	2,603,796	55,892	1,545,285	73,106	....	,, 1853....	1,058,511
From 5 Jan., 1853, to 5 April, 1854		74,403	2,678,199	72,462	1,617,747	1,941	....	5 April, 1854....	1,060,452
From 5 April, 1854, to 31 March, 1855		39,872	2,718,071	63,346	1,681,093	....	23,474	31 March, 1855....	1,036,978
(Fractions—from 1808 to 1855).....		24	24	24	24	....	3	.....	....
Aggregate of whole Period, 46 years and 7 months—from Sept., 1808, to March, 1855		2,718,095	2,718,095	1,681,117	1,681,117	1,036,978	....	.....	29,734,064
Annual Average during whole Period above mentioned.....		58,349	....	36,089	....	22,260	....	.....	638,303
Aggregate of First Period, 20 years and 4 months—from Sept., 1808, to Jan., 1829		870,188	....	238,211	....	631,977	....	.....	6,900,726
Annual Average during ditto....		42,802	....	11,717	....	31,085	....	.....	339,435
Aggregate of Second Period, 26 years and 3 months—from Jan., 1829, to March, 1855		1,847,907	....	1,442,906	....	405,001	....	.....	22,833,338
Annual Average during ditto.....		70,397	....	54,968	....	15,429	....	.....	869,840

TABLE J.—PART I. YEARS 1808—1829.

Statement of PRICES AT TIMES OF COMMUTATION *of Perpetual into Life Annuities.*

1. Dates.	2. Average Price of 3 Per Cent. Stocks.	3. Average Purchase Money of a Perpetual Annuity of £1 on Government Security.	4. Aggregate Amount of Perpetual Annuity Cancelled in each Year by Commutation into Life Annuities (with Allowance for Long Annuity, and for Reduction of Interest.)	5. Estimated Value at time of Commutation of the Perpetual Annuity and Long Annuity (*as per Column* 4 *and Column* 3).
			£	£
From 1 Sept. 1808, to 31 Jan. 1809	66¾	22·25	13,978	311,010
Year ended 31 January, 1810	68¾	22·92	16,757	384,070
,, ,, 1811	67	22·33	8,723	194,785
,, ,, 1812	63¾	21·25	8,723	185,364
,, ,, 1813	59	19·67	10,666	209,800
,, ,, 1814	59¼	19·75	12,003	237,059
,, ,, 1815	66½	22·17	13,010	288,432
,, ,, 1816	59	19·67	9,066	178,328
,, ,, 1817	61⅞	20·62	14,333	295,547
From 31 Jan. 1817, to 5 Jan. 1818	75¼	25·08	27,855	698,600
Year ended 5 January, 1819	78⅛	26·04	18,750	488,250
,, ,, 1820	71½	23·83	12,509	298,089
,, ,, 1821	68⅜	22·79	17,853	406,860
,, ,, 1822	74⅞	24·96	17,605	439,420
,, ,, 1823	79½	26·50	28,487	754,905
,, ,, 1824	79⅝	26·54	29,730	789,034
,, ,, 1825	93⅝	31·21	17,250	538,373
,, ,, 1826	90¼	30·08	17,359	522,158
,, ,, 1827	79¼	26·42	20,615	544,648
,, ,, 1828	84⅜	28·12	20,151	566,646
,, ,, 1829	85⅝	28·54	14,000	399,560
Abstract Average, 1 Sept. 1808, to 5 Jan. 1829	73¼	24·42	.....	.....
Estimate of Compound Average at which the Total Annuity, in Column 4, was commuted—1 Sept. 1808, to 5 Jan. 1829	75 nearly	25·00 nearly	349,423 Total Net Annuity Commuted (1808-1829)	8,730,938 Total Commutation Price (1808-1829)

TABLE J.—PART II. YEARS 1829—1855.

Statement of PRICES AT TIMES OF COMMUTATION *of Perpetual into Life Annuities.*

1. DATES.	2 Average Price of 3 Per Cent. Stocks.	3. Average Purchase Money of a Perpetual Annuity of £1 on Government Security.	4. Total Amount of Perpetual Annuity Cancelled in each Year by Commutation into Life Annuities (with Allowance for Long Annuity, and for Reduction of Interest).	5. Estimated Value at time of Commutation of the Perpetual Annuity and Long Annuity (*as per Column* 4 *and Column* 3).
		£	£	£
Year ended 5 January, 1830	88 5/8	29·54	3,550	104,867
,, ,, 1831	89 3/8	29·79	20,707	616,866
,, ,, 1832	80 7/8	26·96	15,574	419,860
,, ,, 1833	83 3/8	27·79	14,333	398,314
,, ,, 1834	88 1/8	29·37	22,456	659,533
,, ,, 1835	90 5/8	30·21	47,271	1,428,057
,, ,, 1836	91 1/4	30·42	14,033	426,884
,, ,, 1837	90 3/8	30·12	18,007	542,371
,, ,, 1838	91 3/8	30·46	16,033	488,364
,, ,, 1839	93 1/2	31·17	17,575	547,781
,, ,, 1840	91 7/8	30·62	17,580	538,300
,, ,, 1841	89 7/8	29·96	18,242	546,530
,, ,, 1842	89 3/8	29·79	16,279	484,951
,, ,, 1843	91 3/4	30·58	18,845	576,280
,, ,, 1844	95 3/8	31·79	25,285	803,809
,, ,, 1845	99 1/8	33·04	41,872	1,383,451
,, ,, 1846	98 3/8	32·79	26,377	864,902
,, ,, 1847	95 5/8	31·87	21,007	669,493
,, ,, 1848	87 1/4	29·08	13,595	395,342
,, ,, 1849	85 1/2	28·50	14,715	419,378
,, ,, 1850	92 3/8	30·79	20,264	623,928
,, ,, 1851	96 3/8	32·12	38,995	1,252,519
,, ,, 1852	96 7/8	32·29	25,758	831,726
,, ,, 1853	99 1/4	33·08	42,756	1,414,368
From 5 Jan. 1853, to 5 April, 1854	95 3/8	31·79	26,602	845,677
From 5 April, 1854, to 31 Mar. 1855	92 1/8	30·71	2,032	62,402
Abstract Average—5 Jan. 1829, to 31 March, 1855.....	91 3/4	30·58	.....	.....
Estimate of Compound Average at which the Total Annuity, in Column 4, was commuted— 5 Jan. 1829, to 31 March, 1855	93 (nearly)	31·00 (nearly)	559,742 Total Net Annuity commuted (1829-1855)	17,345,953 Total Commutation Price (1829-1855)
Abstract Average from 1 Sept. 1808, to 31 March, 1855.....	83 5/8	27·88	.....	.....
Estimate of Compound Average at which the Total Annuity, in Column 4, was commuted— 1 Sept. 1808, to 31 March, 1855	86	28·68	909,165 Total Net Annuity (1808-1855)	26,076,891 Total Commutation Price (1808-1855)

TABLE K.—PART I. YEARS 1808—1829.

RATIOS OF AMOUNTS OF STOCK PURCHASED WITH MONEY TO THE TOTAL AMOUNTS TRANSFERRED.

1. Dates.	2. Average Rate of Interest on Government Security during the Periods stated in Column 1.	3. Total Amount of Capital Stocks Transferred to, and Cancelled by, the Commissioners, in each Year, including Stock purchased with Money.	4. Total Amount of Stock purchased in each Year by the Commissioners with *Money* paid to them for the grant of Life Annuities.	5. Per Centage Ratio of Stock purchased with Money to the Total Amount Transferred to, and Cancelled by the Commissioners, in each Year.
		£		
From 1 Sept. 1808, to 31 Jan. 1809	4·494	465,951	No Returns during this Period distinguishing the Amount purchased with Money.	Vide Note in preceding Column.
Year ended 31 January, 1810	4·363	558,561		
,, ,, 1811	4·478	290,777		
,, ,, 1812	4·706	290,751		
,, ,, 1813	5·084	355,542		
,, ,, 1814	5·063	400,085		
,, ,, 1815	4·511	433,673		
,, ,, 1816	5·084	302,211		
,, ,, 1817	4·850	352,404		
From 31 Jan. 1817, to 5 Jan. 1818	3·987	873,430		
Year ended 5 January, 1819	3·840	571,761		
,, ,, 1820	4·196	382,240		
,, ,, 1821	4·388	556,996		
,, ,, 1822	4·006	532,133		
,, ,, 1823	3·774	958,916		
,, ,, 1824	3·768	758,892		
,, ,, 1825	3·204	539,174		
,, ,, 1826	3·324	556,769		
,, ,, 1827	3·785	653,603		
,, ,, 1828	3·556	640,852		
,, ,, 1829	3·504	444,275		
Average Rate of Interest from 1 Sept. 1808, to 5 Jan. 1829....	4·095	.....	.....	.....
Estimate of Compound Average at which the Total Stock, in Column 3, was commuted— 1 Sept. 1808, to 5 Jan. 1829....	4·000	10,918,996	.....	.....

TABLE K.—PART II. YEARS 1808—1829

RATIOS OF AMOUNTS OF STOCK PURCHASED WITH MONEY TO THE TOTAL AMOUNTS TRANSFERRED.

1. Dates.	2. Average Rate of Interest on Government Security during the Periods stated in Column 1.	3. Total Amount of Capital Stocks Transferred to, and Cancelled by, the Commissioners, in each Year, including Stock purchased with Money.	4. Total Amount of Stock purchased in each Year by the Commissioners with *Money* paid to them for the grant of Life Annuities.	5. Per Centage Ratio of Stock purchased with Money to the Total Amount Transferred to, and Cancelled by the Commissioners, in each Year.
	£	£	£	
Year ended 5 January, 1830	3·385	104,217	.....	.....
,, ,, 1831	3·357	705,867	296,100	41·9
,, ,, 1832	3·709	485,209	171,800	35·4
,, ,, 1833	3·598	434,262	202,849	46·7
,, ,, 1834	3·405	671,927	441,389	65·7
,, ,, 1835	3·310	1,409,029	998,900	70·9
,, ,, 1836	3·287	430,442	200,800	46·6
,, ,, 1837	3·320	564,970	191,800	33·9
,, ,, 1838	3·283	495,028	189,600	38·3
,, ,, 1839	3·208	577,083	259,100	44·9
,, ,, 1840	3·266	555,160	229,100	41·3
,, ,, 1841	3·338	575,253	212,750	36·8
,, ,, 1842	3·357	523,779	225,900	43·1
,, ,, 1843	3·270	607,022	286,350	47·1
,, ,, 1844	3·146	817,640	336,450	41·1
,, ,, 1845	3·027	1,730,362	1,032,650	59·7
,, ,, 1846	3·050	865,733	514,350	59·4
,, ,, 1847	3·138	686,498	344,750	50·2
,, ,, 1848	3·439	450,215	268,350	59·4
,, ,, 1849	3·509	488,079	263,600	54·0
,, ,, 1850	3·248	669,859	382,500	57·1
,, ,, 1851	3·113	1,292,499	686,900	53·1
,, ,, 1852	3·097	854,261	550,400	64·4
,, ,, 1853	3·023	1,415,261	898,900	63·5
From 5 Jan. 1853, to 5 April, 1854	3·146	885,554	556,179	62·8
From 5 April, 1854, to 31Mar. 1855	3·256	480,225	308,083	64·1
Average Rate of Interest from 5 Jan. 1829, to 31 March, 1855	3·270	.....	.....	.....
Estimate of Compound Average at which the Total Stock, in Column 3, was commuted—5 Jan. 1829, to 31 March, 1855	3·226	18,775,434	10,049,550	53·5

TABLE L.—PART I. YEARS 1808—1829.

ESTIMATED PERPETUAL ANNUITY CHARGE CANCELLED AND LIFE ANNUITY RISK CURRENT, DURING EACH FINANCIAL YEAR.

1. Dates.	2. Amount of Perpetual Annuity Charge (with additions for Long Annuity and corrections for reductions of Interest,) Cancelled and Redeemed, from 1808 down to each of the dates in Column 1.	2. Total Amount of Perpetual Annuity Charge at commencement and at end of each Interval between the dates referred to in preceding columns.	4. Estimated Perpetual Annuity Charge during each of the before-mentioned intervals.	5. Amount of Life Annuity Charge at each of the dates referred to in Column 1.	6. Total Amount of Life Annuity Charge at commencement and at end of each interval between the dates referred to.	7. Estimated LIFE ANNUITY CHARGE during each of the before-mentioned intervals.
	£	£	£	£	£	£
From 1 Sept., 1808, to 31 Jan., 1809	13,978	.....	.....	32,514	.....	.....
Year ended 31 January, 1810	30,735	44,713	22,356	71,741	104,255	52,127
,, ,, 1811	39,458	70,193	35,097	91,543	163,284	81,642
,, ,, 1812	48,181	87,639	43,819	112,426	203,969	101,985
,, ,, 1813	58,847	107,028	53,514	135,672	248,098	124,049
,, ,, 1814	70,850	129,697	64,849	158,685	294,357	147,178
,, ,, 1815	83,860	154,710	77,355	185,678	344,563	172,282
,, ,, 1816	92,926	176,786	88,393	199,845	385,723	192,861
,, ,, 1817	107,918	200,844	100,422	225,254	425,099	212,550
From 31 Jan., 1817, to 5 Jan., 1818	136,027	243,945	121,972	288,490	513,744	256,872
Year ended 5 January, 1819	155,070	291,097	145,549	329,436	617,926	308,963
,, ,, 1820	167,737	322,807	161,403	351,275	680,711	340,355
,, ,, 1821	185,732	353,469	176,735	383,000	734,275	367,138
,, ,, 1822	203,643	389,375	194,687	410,965	793,965	396,982
,, ,, 1823	232,464	436,107	218,054	473,169	884,134	442,067
,, ,, 1824	264,784	497,248	248,624	519,634	992,803	496,402
,, ,, 1825	282,481	547,265	273,632	538,491	1,058,125	529,062
,, ,, 1826	300,054	582,535	291,268	553,945	1,092,436	546,218
,, ,, 1827	320,952	621,006	310,503	589,250	1,143,195	571,598
,, ,, 1828	341,389	662,341	331,170	617,536	1,206,786	603,393
,, ,, 1829	355,523	696,912	348,456	631,977	1,249,513	624,756
Total 20 years and 4 months—from Sept., 1808, to Jan., 1829.....	3,492,609	6,615,717	3,307,858	6,900,726	13,136,961	6,568,480

ESTIMATED PERPETUAL ANNUITY CHARGE CANCELLED AND LIFE ANNUITY RISK CURRENT, DURING EACH FINANCIAL YEAR.

1. Dates.	2. Amount of Perpetual Annuity Charge (with additions for Long Annuity and corrections for reductions of Interest,) Cancelled and Redeemed, from 1808 down to each of the dates in Column 1.	3. Total Amount of Perpetual Annuity Charge at commencement and at end of each Interval between the dates referred to in preceding column.	4. Estimated Perpetual Annuity Charge during each of the before-mentioned intervals.	5. Amount of Life Annuity Charge at each of the dates referred to in Column 1.	6. Total Amount of Life Annuity Charge at commencement and at end of each interval between the dates referred to.	7. Estimated LIFE ANNUITY CHARGE during each of the before-mentioned intervals.
	£	£	£	£	£	£
Year ended 5 January, 1830	359,247	714,770	357,385	618,058	1,250,035	625,018
,, ,, 1831	380,019	739,266	369,633	669,360	1,287,418	643,709
,, ,, 1832	395,593	775,612	387,806	718,488	1,387,848	693,924
,, ,, 1833	409,926	805,519	402,760	717,528	1,436,016	718,008
,, ,, 1834	432,382	842,308	421,154	790,124	1,507,652	753,826
,, ,, 1835	479,653	912,035	456,017	911,495	1,701,619	850,809
,, ,, 1836	493,686	973,339	486,670	893,633	1,805,128	902,564
,, ,, 1837	511,693	1,005,379	502,689	874,230	1,767,863	883,932
,, ,, 1838	527,726	1,039,419	519,510	855,381	1,729,611	864,805
,, ,, 1839	545,320	1,073,046	536,523	851,717	1,707,098	853,549
,, ,, 1840	562,900	1,108,220	554,110	858,332	1,710,049	855,024
,, ,, 1841	581,142	1,144,042	572,021	857,855	1,716,187	855,094
,, ,, 1842	597,421	1,178,563	589,281	840,776	1,698,631	849,315
,, ,, 1843	616,266	1,213,687	606,844	826,357	1,667,133	833,567
,, ,, 1844	641,551	1,257,817	628,908	842,054	1,668,411	834,205
,, ,, 1845	683,423	1,324,974	662,407	959,555	1,801,609	900,805
,, ,, 1846	709,800	1,393,223	696,611	962,982	1,922,537	961,268
,, ,, 1847	730,807	1,440,607	720,304	980,505	1,943,487	971,744
,, ,, 1848	744,402	1,475,209	737,604	896,976	1,877,481	938,740
,, ,, 1849	759,117	1,503,519	751,760	886,038	1,783,014	891,507
,, ,, 1850	779,381	1,538,498	769,249	901,405	1,787,443	893,722
,, ,, 1851	818,376	1,597,757	798,879	979,143	1,880,548	940,274
,, ,, 1852	844,134	1,662,510	831,255	985,405	1,964,548	982,274
,, ,, 1853	886,890	1,731,024	865,512	1,058,511	2,043,916	1,021,958
From 5 Jan., 1853, to 5 April, 1854	913,492	1,800,382	900,191	1,060,452	2,118,963	1,059,482
From 5 April, 1854, to 31 March, 1855	915,524	1,829,016	914,508	1,036,978	2,097,430	1,048,715
Total 46 years and 7 months—from Sept., 1808, to March, 1855	19,812,480	38,695,458	19,347,729	29,734,064	58,398,636	29,199,318

TABLE M.—PART I. YEARS 1808—1829.

ACCUMULATED AMOUNT *of* EXCESS *of Annual* LIFE ANNUITY RISK *Current*, OVER *the* PERPETUAL ANNUITY CHARGE CANCELLED; *showing the Aggregate Amounts from* 1808 *down to separate dates of each year.*

1. Dates.	2. Difference, or Excess, of Life Annuity charge over the Perpetual Annuity charge, being the Amounts in Column 7 of Table L, Part I., less the Amounts in Column 4 of the same Table.	3. Half Year's Interest at 5 Per Cent. upon the Differences given in preceding Column.	4. Column 2, *plus* Column 3, being the Estimated Amount of Differences in Column 2, with Simple Interest added.	5. Aggregate Amounts, from Sept., 1808, down to each separate Date, of the Excess of Life Annuity Charge, with 5 Per Cent. Simple Interest.	6. Aggregate Amounts, from Sept., 1808, down to each separate Date, of the Excess of Life Annuity Charge over Perpetual Annuity Charge, with 5 Per Cent. Compound Interest.
	£	£	£	£	£
From 1 Sept. 1808, to 31 Jan. 1809....	.....	.....	.....	.....	.....
Year ended 31 January, 1810	29,771	744	30,515	30,515	30,515
,, ,, 1811	46,545	1,163	47,708	78,223	79,748
,, ,, 1812	48,166	1,454	59,620	137,843	143,355
,, ,, 1813	70,535	1,763	72,298	210,141	222,821
,, ,, 1814	82,329	2,058	84,387	294,528	318,349
,, ,, 1815	94,927	2,373	97,300	391,828	431,566
,, ,, 1816	104,468	2,611	107,079	498,907	560,223
,, ,, 1817	112,128	2,803	114,931	613,838	703,165
From 31 Jan. 1817, to 5 Jan. 1818....	134,900	3,372	138,272	752,110	876,595
Year ended 5 January, 1819	163,414	4,085	167,499	919,609	1,087,923
,, ,, 1820	178,952	4,473	183,425	1,103,034	1,325,744
,, ,, 1821	190,403	4,760	195,163	1,298,197	1,587,194
,, ,, 1822	202,295	5,057	207,352	1,505,549	1,873,905
,, ,, 1823	224,013	5,600	229,613	1,735,162	2,197,213
,, ,, 1824	247,778	6,194	253,972	1,989,134	2,561,045
,, ,, 1825	255,430	6,385	261,815	2,250,949	2,950,913
,, ,, 1826	254,950	6,373	261,323	2,512,272	3,359,782
,, ,, 1827	261,095	6,527	267,622	2,779,894	3,795,388
,, ,, 1828	272,223	6,805	279,028	3,058,922	4,264,180
,, ,, 1829	276,300	6,907	283,207	3,342,129	4,760,596
Total, 20 years and 4 months—from Sept. 1808, to Jan. 1829.....	3,260,622	81,507	3,342,129	3,342,129	4,760,596

TABLE M.—PART II. YEARS 1829—1855.

ACCUMULATED AMOUNT *of* EXCESS *of* ANNUAL LIFE ANNUITY RISK *Current*, OVER *the* PERPETUAL ANNUITY CHARGE CANCELLED; *showing the Aggregate Amount from* 1808 *down to separate dates of each year.*

1. Dates.	2. Difference, or excess, of Life Annuity charge over the Perpetual Annuity charge; being the amounts in Column 7 of Table L, Part II, less the amounts in Column 4 of the same table.	3. Half Year's Interest at 4 Per Cent. upon the differences given in preceding column.	4. Column 2, *plus* Column 3, being the estimated amount of differences in Column 2, with Simple Interest added.	5. Aggregate Amounts from September, 1808, down to each separate date, of the excess of Life Annuity charge, with 5 Per Cent. Simple Interest to 1829, and 4 Per Cent. from 1829 to 1855.	6. Aggregate Amounts from September, 1808, down to each separate date, of the excess of Life Annuity charge over Perpetual Annuity charge, with 5 Per Cent. Compound Interest from 1808-29, and 4 Per Cent. from 1829-55.
	£	£	£	£	£
Year ended 5 January, 1830	267,633	5,352	272,985	3,615,114	5,224,005
,, ,, 1831	274,076	5,482	279,558	3,894,672	5,712,523
,, ,, 1832	306,118	6,122	312,240	4,206,912	6,253,264
,, ,, 1833	315,248	6,305	321,553	4,528,465	6,824,947
,, ,, 1834	332,672	6,653	339,325	4,867,790	7,437,270
,, ,, 1835	394,792	7,896	402,688	5,270,478	8,137,449
,, ,, 1836	415,894	8,318	424,212	5,694,690	8,887,159
,, ,, 1837	381,243	7,625	388,868	6,083,558	9,631,513
,, ,, 1838	345,095	6,901	351,996	6,435,554	10,368,769
,, ,, 1839	317,026	6,340	323,366	6,758,920	11,106,885
,, ,, 1840	300,914	6,018	306,932	7,065,852	11,858,092
,, ,, 1841	286,073	5,721	291,794	7,357,646	12,624,210
,, ,, 1842	260,034	5,200	265,234	7,622,880	13,394,412
,, ,, 1843	226,723	4,534	231,257	7,854,137	14,161,445
,, ,, 1844	205,297	4,106	209,403	8,063,540	14,937,306
,, ,, 1845	238,318	4,766	243,084	8,306,624	15,777,882
,, ,, 1846	264,657	5,293	269,950	8,576,574	16,678,947
,, ,, 1847	251,440	5,029	256,469	8,833,043	17,602,574
,, ,, 1848	201,136	4,023	205,159	9,038,202	18,511,836
,, ,, 1849	139,747	2,795	142,542	9,180,744	19,394,851
,, ,, 1850	124,473	2,489	126,962	9,307,706	20,297,607
,, ,, 1851	141,395	2,828	144,223	9,451,929	21,253,734
,, ,, 1852	151,019	3,020	154,039	9,605,968	22,257,922
,, ,, 1853	156,446	3,129	159,575	9,765,543	23,307,813
From 5 Jan., 1853, to 5 April, 1854	159,291	3,928	163,219	9,928,762	24,641,023
From 5 April, 1854, to 31 March, 1855	134,207	2,684	136,891	10,065,653	25,754,018
Total 46 years and 7 months—from Sept., 1808, to 31 March, 1855	9,851,589	214,064	10,065,653	10,065,653	25,754,018

Table N.—Years 1829—1855.

Statement of Aggregate Amount of Deferred Life Annuities outstanding, (*including Deferred Annuities granted under* 10 *Geo. IV.*, *c.* 24; 3 *Will. IV.*, *c.* 14; 7 *&* 8 *Vict.*, *c.* 83, *and* 16 *&* 17 *Vict.*, *c.* 45.)

Dates.	Aggregate Amount of Deferred Annuities outstanding.	Increase or Decrease from year to year.	Dates.	Aggregate Amount of Deferred Annuities outstanding.	Increase or Decrease from year to year.
	£	£		£	£
Year ended 5 January, 1830	?	....	Year ended 5 January, 1843	6,324	+ 358
,, ,, 1831	?	....	,, ,, 1844	7,143	+ 819
,, ,, 1832	1,609	....	,, ,, 1845	9,868	+2,725
,, ,, 1833	1,254	− 355	,, ,, 1846	12,046	+2,178
,, ,, 1834	1,555	+ 301	,, ,, 1847	13,714	+1,668
,, ,, 1835	3,826	+2,271	,, ,, 1848	16,276	+2,562
,, ,, 1836	3,989	+ 163	,, ,, 1849	18,986	+2,710
,, ,, 1837	4,223	+ 234	,, ,, 1850	26,799	+7,813
,, ,, 1838	4,879	+ 656	,, ,, 1851	32,625	+5,826
,, ,, 1839	5,157	+ 278	,, ,, 1852	34,033	+1,408
,, ,, 1840	5,568	+ 411	,, ,, 1853	33,160	− 873
,, ,, 1841	5,713	+ 145	Year ended 5 April, 1854	31,714	−1,446
,, ,, 1842	5,966	+ 253	Year ended 31 March, 1855	29,593	−2,120

End of Appendix of Tables.

Report on the Proceedings of the International Congrès de Bienfaisance, held at Brussels, September, 1856. By W. G. Lumley, Esq., *one of the Honorary Secretaries of the Statistical Society.*

Sussex Place, Regent's Park,
October 29th, 1856.

My Lords and Gentlemen,

I have to report to you that, in accordance with the resolution of the Council of July 4th, 1856, nominating me, with Dr. Farr, as delegates on their behalf to the International Congrès de Bienfaisance at Brussels, I attended the meeting of that Congress, which commenced its sittings on the 15th of last month, and continued them until noon of the 20th. I much regret that Dr. Farr was prevented, by unavoidable circumstances, from being present.

It was an assembly of much importance, whether considered with reference to the many eminent persons who attended it, the respect which the Belgian Government paid to it, or the extreme gravity of most of the questions discussed at the meetings.

The number of members present was about 200; and many other persons who were unable to attend, nevertheless sent letters of adherence. Several of the foreign honorary members of this society were present; namely, Professors Friedlander and Mittermaier, from Heidelberg; Dr. Engel, from Dresden; M. Jos. Garnier, from Paris; Dr. Bertini, from Sardinia; and M. von Baumhauer, from Holland, Professor Ackersdyk, from Utrecht, MM. Ducpetiaux and Visschers, of Brussels, were the secretaries of the Congress. Among the persons who came from England should be mentioned the Hon. Mr. Cowper, President of the Board of Health; Mr. Wm. Ewart, M.P.; Mr. E. Chadwick, C.B.; Mr. F. O. Ward; Mr. Simon, of the Board of Health; Mr. Alderman Harvey, of Manchester; Mr. H. Roberts; and Mr. Twining.

M. Rogier, formerly Minister of the Interior in Belgium, was elected President of the Congress; but, after having opened the meeting with an address of great force and eloquence, he was compelled, by a domestic affliction, to be absent for several days, and his place was ably filled by M. Ch. Faider, formerly Minister of Justice. M. Rogier returned to the assembly before the conclusion, and pronounced the parting address.

It will be in your remembrance that the Committee of Organization, in October of last year, published a sketch of a programme of the discussions proposed for the Congress, which was then designated the Congrès de la Charité. That programme was rather in the nature of a syllabus, containing a vast number of topics for consideration, than a practical scheme for deliberate discussion. The Council caused a translation of that programme, together with M. Ducpetiaux's letter of instruction, to be printed and circulated among the members of the Society, and then established the committee for the purpose of collecting information relative to the Beneficent Institutions in the Metropolis, which has prepared, and will soon be ready to present to you, a report on that branch of their inquiry which relates to the medical charities of London.

At the commencement of this year, when the war was raging, and when no hope of the return of peace had yet arisen, great alarm was felt in Belgium, as in other countries, in reference to the means of subsistence for the poor and the working classes in the coming autumn and winter. The members of the Committee of Organization, consisting of the following gentlemen, Comte J. Arrivabene, MM. I. G. E. Bidaut, Ed. Ducpetiaux, Ch. Faider, Ch. Rogier, Ed. Romberg, and Aug. Visschers, deemed it advisable, therefore, to narrow the scope of the discussions to be held at this Congress, and to confine them particularly to questions relating to the means of subsistence (*subsistances*).

They observed in the introduction to their programme, that—

"The insufficiency, or the dearness of provisions, the disproportion between their cost and the ordinary rate of wages, the smallness and bad state of their lodgings, and the want of the conditions essential for health and life, are evils almost universal, which afflict, in a manner more or less intense, the working classes in all countries. If it be out of the power of man absolutely to suppress these evils, they may be alleviated in some measure; at least their causes may be combatted, or their consequences neutralised. The means of giving effect to these objects enter into the sphere of agriculture, political and charitable economy, and scientific and industrial processes."

The programme, accordingly, divided the subjects of discussion into three parts or sections. The *first* treated of the means of subsistence (*subsistances*) in their relation with agriculture; and the *second* in their relation with political and charitable economy. The *third* was more elaborate, and referred to their relations with scientific and industrial processes, and therein to the means of facilitating and bringing to perfection manual labour, of rendering trades healthy, of preventing accidents, and of ameliorating the lodging, furniture, and clothing of the working classes.

Under each section were propounded the various propositions which, in the opinion of the Committee, arose out of, or were involved in, the general topic of the section; and it was impossible not to admire the ability and vast knowledge of economic science exhibited in this document.

There was an appendix which comprised certain subjects referred to under the second section, and entered into a more complete and elaborate consideration of them. These subjects may be stated briefly, thus:—the abuse of spirituous liquors; the establishment of public and co-operative societies for the procuring of good, cheap, and full-measured articles for the poor; the establishment of benefit societies, savings' banks and provident institutions; the prevention of the irregular accumulation of the population in particular localities; and emigration.

Such was the programme laid out for the discussions; and every member of the Congress was invited to enrol himself under the section which appeared most suitable to his views.

It is obvious from these remarks that the Congress was not, in the strict sense of the term, a Statistical Congress. I apprehend that, though its title *Bienfaisance* may be rendered into English by

the words *Benevolence* or *Philanthropy*, neither word in an adequate manner describes the full design or nature of the discussions. The topics did not exhaust the science which is now beginning to be understood in England by the name of economic science, but they formed a large part of it; and though in terms they related to the condition of the poor and the working classes, they extended through them up to every grade of society. It will be difficult to understand that there can be a disorganized, impoverished, distressed, or diseased state of the lower ranks of the population without the middle and upper classes being at the same time painfully affected.

But as the discussions were of this character, I do not consider myself warranted in going further into detail upon the various subjects discussed in the sections, and afterwards brought under the notice of the general meetings of the Congress.

It was, however, part of the order of the proceedings that an account should be given, in reference to every different nation represented at the Congress, of the most recent measures taken in it, either to prevent or alleviate what were termed alimentary crises, or to ameliorate the condition of the working classes in general.

It appeared that England, France, Germany, Austria, Switzerland, Sweden, Norway, Denmark, Holland, Portugal, Piedmont, and Brazil were represented by special delegates, and from all reports were given as to the progress of those countries.

The persons who addressed the meetings were Mr. F. O. Ward and Mr. Ewart for England, M. Wolowski for France, M. Schubert for Prussia, M. Moritz de Stubenrach for Austria, M. von Baumhauer, M. Jonnes, and M. Suringar for Holland, M. de Knonan for Switzerland, M. Mittermaier for Baden, Dr. Engel for Saxony, Dr. Graehs for Sweden, Dr. Faye for Norway, M. David for Denmark, M. Chev. Bertini for Sardinia, M. da Mota for Brazil, M. Suzanni for Lombardy, and M. Wychman for Hamburgh, while M. Ducpetiaux and M. Visschers presented reports in respect of Belgium, which were printed in the "Moniteur Belge" for public perusal.

These addresses were all of interest, and proved that the governments and influential persons of these countries have not been wanting in their exertions to promote the welfare of the lower orders of society. But they were for the most part of a summary and general character, though a few of the members gave some detailed and statistical information relative to the institutions of their several countries. Much statistical information was supplied by some of the members who prepared the reports of the sections on particular subjects, and, among the few discussions which took place at the general meetings, some strictly statistical details were laid before the assembly. I ought to refer especially to a remarkable address of M. Wolowski, who, in combatting what he considered to be an attack upon the partition system of France, gave a series of results to establish, in successive years, the gradual but continued progress of that country in territorial wealth and prosperity, notwithstanding the operation of the system which is so much questioned in other countries. M. Haec, of Belgium, who reported the views of the first section, on the subject of *crédit foncier* and *crédit agricole*, as tending to stimulate and aid agricultural enterprises, also gave some inter-

esting statistical details relative to the operations of the bank at Brussels, termed *La Société de l'Union du Crédit de Bruxelles.*

But it is necessary that one matter discussed at the Congress should be communicated to this society. In the programme it was proposed that, with the view of extending and consolidating the work of the Congress, the members should consider the means of organizing definitively international correspondence, according to the principles laid down at the international Réunion of Charity at Paris, and of publishing a periodical bulletin of the works, reports, and documents which, in different countries, relate to charitable economy. This subject was submitted to the members of the third section, who made a report, in which they recommended the Congress to declare that it was necessary to create an international correspondence, by means of which there might be a mutual communication of all facts, publications, reports, and other documents which relate to benevolence, and the ameliorations and reforms which affect the working and indigent classes of all countries. For this purpose, they recommended the following proposals:—

That there should be established in every country an office of correspondence, or a society charged with the collection of documents transmitted to them from foreign countries, and the return in exchange of the documents of their own nation: and they stated that several existing institutions, among others the Statistical Society of London, might act as offices of this national correspondence.

That in order to combine the different offices, and to impress a uniform direction upon their labours and communications, the office about to be created in Belgium should act provisionally as a central direction, and under this title should transmit such instructions as they should judge useful to the corresponding offices in foreign countries. It should organize, as soon as it was in complete action, a special publication of the documents which it should receive, and deliver them to their library.

That each office should carefully ascertain the most prompt, sure, and economical mode of transmitting its parcels to the offices of correspondence of the other countries, of which a list should be supplied by the central direction.

It was then proposed that a kind of circular letter should be given to persons travelling into foreign countries, which should place them in relation with such offices, so that they might receive every facility in their visits and researches, and be put in possession of the information which they might require in the foreign country to which they went. The proposition was stated in general terms, but was doubtless intended to apply to researches and inquiries of a statistical or economical character.

They proceeded to recommend that every office or association should publish an annual bulletin of publications, reports, and other documents of a nature calculated to interest the general association; or should transmit the document in manuscript to the central office in Belgium, which might comprise it in their bulletin. The interchange of these bulletins, and generally of all the documents and publications to which they might relate, should take place regularly among all the associated countries.

That due consideration should be given as to the means of extending the advantages of this correspondence to all persons of every country who might interest themselves in works of benevolence, and who might desire to profit, under certain conditions, by the relations and interchanges which would thus be established between different countries.

It was further proposed that one or more correspondents for every country represented at the Congress should be named at it, with whom the central direction at Brussels might place itself in relation to carry out these resolutions.

When these propositions were submitted to the Congress at their general meeting, an objection was made to the making special mention therein of any particular societies or institutions, which objection prevailed; and, with the omission of that passage, the report was adopted.

I had no authority to offer the Statistical Society as an institution which could undertake the functions prescribed for England, nor do I think that the Council wonld be prepared to recommend the Society to form one of the representatives of this great international scheme of a statistical depot, though it is impossible to over estimate the great value of this scheme if carried into effective operation.

I presented to the Congress a copy of the report on the Medical Charities of the Metropolis, already referred to as in course of preparation by a Committee of the Council of this Society; and it was acknowledged to be a document containing much interesting information.

In closing this brief notice of the proceedings of the Congress, I cannot but express the feelings, which prevailed with all the foreign members who were present, of admiration and gratitude towards the enlightened men of this kingdom of Belgium, (a state so small and apparently so insignificant in the scale of European nations,) who, by their intelligence, energy, and activity, have been able to assemble in their capital men of the greatest ability, and of the most eminent position, from every important nation, to discuss the gravest of economical questions; and who thus propound to the world at large, for universal adoption, principles and details which, upon careful and severe discussion, appear to be best calculated to promote the well being of mankind. Through their exertions Belgium stands forward pre-eminent among those nations whose works of peace shall claim the brightest renown in history.

I am,
Your obedient Servant,
W. G. Lumley.

To the Council of
the Statistical Society.

MISCELLANEA.

Twenty-sixth Meeting of the British Association for the Advancement of Science, held at Cheltenham, 6th—13th August, 1856. *Section F.—Economic Science and Statistics.*

President.—Lord Stanley, M.P.

Vice-Presidents.—Thomas Tooke, F.R.S.; John Strang, LL.D.; William Tite, M.P., F.R.S.; John T. Danson; James Heywood, M.P., F.R.S.; William Farr, M.D., F.R.S.; R. Monckton Milnes, M.P.

Secretaries.—William Newmarch; W. Neilson Hancock, LL.D.; Edward Cheshire, F.R.G.S.; Rev. C. H. Bromby, M.A.; W. M. Tartt, M.S.A.

Committee.—Richard Atkinson; W. Jones Armstrong; Edmund Ashworth; Richard Barrington; Richard Beamish, F.R.S.; Robert Ball, LL.D., M.P.; Dr. Booth; Samuel Brown, F.S.S.; W. Mc. G. Bond; Samuel Bailey; Dr Camps; L. K. Daa, of Christiania; George Hadfield, M.P.; G W. Hastings; Rowland Hill, F.R.A.S.; M. D. Hill; Rev. A. Hume, D.C.L., LL.D.; John Lee, LL.D., F.R.S.; J. S. More, F.R.S.E.; James McClelland; William Neild; Lieutenant-General Sir Charles W. Pasley, K.C.B., R.E., F.R.S.; James Perry; Professor Rogers, of the United States; H. W. Rumsey, F.R.C.S.; R. J. Spiers, F.S.S.; John Shuttleworth; James Yates, F.R.S.

The following Papers occupied the attention of the Section, viz. :—

1. *Lord Stanley, (President of the Section.)*—Opening Address.
2. *James W. Gilbart, F.R.S.*—The Family Principle in London Banking.
3. *John T. Danson.*—On the Connection between Slavery in the United States of America and the Cotton Manufacture in the United Kingdom.
4. *John Strang. LL.D.*—On the Progress, Extent, and Value of the Earthenware, Porcelain, and Glass Manufacture of Glasgow.
5. *William Newmarch.*—On the Former and Present Plans of disposing of the Waste Lands in the Australian Colonies.
6. *Vincent Scully, M.P.*—On the Population of Ireland, from 1603 to 1856, with Notes suggestive of the causes for the periodical increase or decrease.
7. *John Strang, LL.D.*—On the money rate of wages of labour in Glasgow and the West of Scotland.
8. *William Newmarch.*—On the Credit Mobilier and other recent Credit Institutions in France.
9. *John T. Danson.*—On the Wirral Peninsula: its condition and prospects in connection with Liverpool and the Manchester District.
10. *W. Neilson Hancock, LL.D.*—The definition of Income in Economic Science compared with the existing Taxes on Income.
11. *W. M. Tartt, M.S.A.*—On some Statistics bearing upon the Relations existing between Poverty and Crime.
12. *Richard Beamish, F.R.S.*—On the Statistics of Cheltenham.
13. *Edward Clibborn.*—On the Tendency of European Races to become extinct in the United States.
14. *The Rev. C. H. Bromby, M.A.*—Suggestions on the People's Education.
15. *John T. Danson.*—On the Diversity of Measures in the Corn Markets of the United Kingdom.
16. *Richard Hussey Walsh, LL.B.*—A Deduction from the Statistics of Crime for the last Ten Years.
17. *T. Barwick Lloyd Baker.*—Statistics and Suggestions connected with the Reformation of Juvenile Offenders.
18. *Mary Carpenter.*—On the position of Reformatory Schools in reference to the State, and the general principles of their Management, especially as regards Female Reformatories.
19. *R. Thomson Jopling.*—On the Mortality among Officers of the British Army in the East.
20. *R. G. Latham, M.D.*—Statistics of the Albanians.
21. *Louis K. Daa, of Christiania.*—On the last Census of the Laps of Norway.

22. *James Yates, M.A., F.R.S.*—Illustrations of the Metrical System of Measures, Weights, and Coins.
23. *Major-General Sir Charles W. Pasley, C.B., R.E., F.R.S.*—Plan for simplifying and improving the Measures, Weights, and Money of this country without materially altering the present Standards.
24. *Samuel Brown, F.S.S.*—On the advantage to Statistical Science of a uniform Decimal System of Measures, Weights, and Coins throughout the World.
25. *Richard Hussey Walsh, LL.B.*—Observations on the present Export of Silver to the East.
26. *H. W. Rumsey, F.R.C.S.*—On the Territorial distribution of the Population, for purposes of Social and Sanitary Economy.
27. *M. Roth, M.D.*—Aphoristic Notes on Sanitary Statistics of Workhouses and Charitable Institutions.

THE MARRIAGES, BIRTHS, AND DEATHS,
REGISTERED IN THE DIVISIONS, COUNTIES, AND DISTRICTS OF ENGLAND.

The Marriages for the Quarter ended June, 1856, *and the Births and Deaths for the Quarter ended September*, 1856,

AS PUBLISHED BY AUTHORITY OF THE REGISTRAR-GENERAL.

THIS return comprises the births and deaths registered by 2,196 registrars in all the districts of England during the summer quarter that ended on September 30th, 1856; and the marriages in 12,194 churches or chapels, about 3,783 registered places of worship unconnected with the Established Church, and 628 superintendent registrars' offices, in the quarter that ended on June 30th, 1856.

MARRIAGES.—77,434 persons were married in the three months of April, May, and June; and the marriage rate of the quarter was ·817 per cent. per annum. The

Marriages, Births, and Deaths, returned in the Years 1844-56 *and in the Quarters of those Years.*

YEARS.....	1844	1845	1846	1847	1848	1849	1850	1851	1852	1853	1854	1855	1856
Marriages	132249	143743	145664	135845	138230	141883	152744	154206	158782	164520	159727	151774	...
Births	540763	543521	572625	539965	563059	578159	593422	615865	624012	612391	634405	635123	...
Deaths	356933	349366	390315	423304	399833	440839	368995	395396	407135	421097	437905	426242	...
	MARRIAGES.												
Quarters ended the last day of													
March	26387	29551	31417	27480	28398	28429	30567	32724	32977	35149	33234	29131	33388
June	34268	35300	37111	35197	34721	35844	39204	38635	40092	40446	40518	38454	38717
September	31675	35003	35070	32439	32995	33874	37636	37316	38400	39899	38182	37151	...
December	39919	43889	42066	40729	42116	43736	45337	45531	47313	49026	47793	47038	...
	BIRTHS.												
March	143578	143080	145108	146453	139736	153772	144551	157286	161803	161729	160785	166186	169252
June	136941	136853	149450	139072	149760	153693	155865	159073	159031	158697	172457	165250	173204
September	130078	132369	138718	127173	140359	135223	146911	150594	151222	147602	154724	154834	157633
December	130166	131219	139349	127267	133204	135471	146095	148912	151956	144363	146439	148853	...
	DEATHS.												
March	101024	104664	89484	119672	120032	105870	98430	105359	106358	118119	111843	134605	103208
June	85337	89149	90230	106718	99727	102153	92871	99458	100625	107647	102586	106584	100310
September	79708	74872	101664	93435	87638	135227	85849	91499	100382	92201	113843	87934	91330
December	90864	80681	108937	103479	92436	97589	91845	99080	99770	103130	109633	97119	...

average rate of the quarter is ·855. The marriages (38,717) exceed by 263 the marriages in the corresponding quarter of the year 1855, but are fewer by 1,801 than the marriages in the spring quarter of 1854.

Births.—157,633 children, born alive, were registered in the quarter ended on the last day of September. The birth-rate of the quarter is 3·278 per cent. per annum, while the average rate is 3·200. The number of births exceed by 2,799 the births in the corresponding quarter of 1855, and is the greatest that has ever been registered before in England in the corresponding quarter of the year.

Increase of Population.—As the births amounted to 157,633, and the deaths to 91,330, the increase in the quarter was 66,303. We have no returns of the immigrants into England and Wales. The emigrants from the ports of the United Kingdom, at which there are government emigration agents, amounted to 50,228, of whom 19,225 were of English origin.

The number of English emigrants exceeds by 3,695 the number in the summer quarter of the year 1855.

The Price of Provisions, and the Weather.—The mean temperature of the quarter at Greenwich was 59°·9, and differed little from the average of 15 years. The rain-fall was in defect in July and August, but in excess in September; it was,

England;†—Annual Rate per Cent. of Marriage, Birth, and Death, during the Years 1846-56, *and the Quarters of those Years.*

Estimated Population of England in thousands in the middle of each Year.....	16925	17132	17340	17552	17766	17983	18206	18403	18619	18786	...	19043
Years	1846	1847	1848	1849	1850	1851	1852	1853	1854	1855	Mean, 1846–55	1856
Marriages.....	·861	·793	·797	·808	·860	·858	·872	·894	·858	·808	·841	...
Births	3·383	3·152	3·247	3·294	3·340	3·425	3·428	3·328	3·407	3·381	3·339	...
Deaths	2·306	2·471	2·306	2·512	2·077	2·199	2·236	2·288	2·352	2·269	2·302	...
	Marriages.											
Quarters ended the last day of												
March	·757	·655	·661	·661	·702	·742	·730	·778	·728	·631	·705	·707
June	·882	·826	·805	·822	·888	·864	·885	·883	·875	·822	·855	·817
September	·822	·751	·755	·766	·840	·822	·836	·859	·813	·783	·805	...
December.....	·983	·940	·961	·986	1·010	1·000	1·027	1·053	1·015	·989	·996	...
	Births.											
March	3·498	3·488	3·252	3·575	3·321	3·567	3·582	3·578	3·520	3·602	3·498	3·585
June	3·551	3·265	3·474	3·523	3·530	3·557	3·509	3·464	3·722	3·534	3·513	3·655
September	3·251	2·945	3·211	3·056	3·281	3·317	3·291	3·177	3·294	3·265	3·209	3·278
December.....	3·256	2·938	3·038	3·053	3·253	3·270	3·298	3·100	3·111	3·128	3·145	...
	Deaths.											
March	2·157	2·850	2·794	2·462	2·261	2·388	2·354	2·613	2·449	2·918	2·525	2·186
June	2·144	2·506	2·313	2·341	2·107	2·224	2·221	2·355	2·214	2·279	2·270	2·117
September	2·382	2·163	2·005	3·057	1·917	2·015	2·185	1·985	2·423	1·854	2·199	1·899
December.....	2·545	2·389	2·108	2·199	2·045	2·176	2·165	2·214	2·329	2·041	2·221	...

† The table may be read thus, without reference to the decimal points:—In the year 1848, to 100,000 of the population of England there were 797 marriages, 3,247 births, and 2,306 deaths registered. The annual rates of marriage in each of the four quarters were ·661, ·805, ·755, and ·961 per cent.; the rates of death 2·794, 2·313, 2·005, and 2·108 per cent. In reading the population on the first line add three ciphers (000). The three months January, February, March, contain 90, in leap year 91 days; the three months April, May, June, 91 days; each of the last two quarters of the year 92 days. For this inequality a correction has been made in the calculation.

on the whole, 1·2 inches below the average. The wind blew at the average rate of 77 miles daily. The barometer stood at 29·743 inches, which is ·071 inches below the average.

The fluctuations of the price of provisions can be traced in the annexed table. Wheat was at the average rates of 63*s.* 10*d.*, 76*s.* 1*d.*, and 72*s.* 3*d.*, during the months of July, August, and September, in 1854-5-6. The wheat and wheat-flour entered for home consumption more than doubled the quantity entered in the corresponding weeks of 1854 and 1855; while the quarters of wheat sold weekly have been less in number than the quarters sold in the corresponding weeks of 1855. Wheat is

The Average Prices of Consols, of Wheat, Meat, and Potatoes, also the Average Quantity of Wheat sold and imported Weekly, in each of the nine Quarters ended September 30th, 1856.

Quarters ended	Average Price of Consols (for Money.)	Average Price of Wheat per Quarter in England and Wales.	Wheat sold in the 290 Cities and Towns in England and Wales making Returns.	Wheat and Wheat Flour entered for Home Consumption at Chief Ports of Great Britain.	Average Prices of Meat per lb. at Leadenhall and Newgate Markets (by the Carcase).		Average Prices of Potatoes (York Regents) per Ton at Waterside Market, Southwark.
			Average Number of Quarters weekly.		Beef.	Mutton.	
1854	£						
Sept. 30.	93⅞	63*s.* 10*d.*	56,389	48,135	4¾*d.*—6¾*d.* Mean 5¾*d.*	5*d.*—7*d.* Mean 6*d.*	75*s.*—85*s.* Mean 80*s.*
Dec. 31.	93⅝	68*s.* 0*d.*	128,783	19,513	4½*d.*—6¾*d.* Mean 5⅝*d.*	5*d.*—7*d.* Mean 6*d.*	95*s.*—105*s.* Mean 100*s.*
1855							
Mar. 31.	91⅞	69*s.* 11*d.*	88,000	33,821	4¾*d.*—6½*d.* Mean 5⅝*d.*	4¾*d.*—6½*d.* Mean 5⅝*d.*	105*s.*—120*s.* Mean 112*s.* 6*d.*
June 30.	90⅝	73*s.* 4*d.*	94,791	57,068	4½*d.*—6½*d.* Mean 5½*d.*	4¾*d.*—6¾*d.* Mean 5¾*d.*	110*s.*—130*s.* Mean 120*s.*
Sept. 30.	90⅝	76*s.* 1*d.*	94,545	51,511	5*d.*—6¾*d.* Mean 5⅞*d.*	5*d.*—7*d.* Mean 6*d.*	69*s.*—79*s.* Mean 74*s.*
Dec. 31.	88¼	79*s.* 4*d.*	126,893	42,358	4¾*d.*—6¾*d.* Mean 5¾*d.*	4¾*d.*—6¾*d.* Mean 5¾*d.*	90*s.*—100*s.* Mean 95*s.*
1856							
Mar. 31.	90⅝	72*s.* 4*d.*	92,152	48,018	4¼*d.*—6¼*d.* Mean 5¼*d.*	4¼*d.*—6½*d.* Mean 5⅜*d.*	78*s.*—93*s.* Mean 86*s.*
June 30.	93⅜	68*s.* 8*d.*	104,952	63,093	4¼*d.*—6¼*d.* Mean 5¼*d.*	5*d.*—6¾*d.* Mean 5⅞*d.*	70*s.*—90*s.* Mean 80*s.*
Sept. 30.	95	72*s.* 3*d.*	78,208	117,807	4½*d.*—6½*d.* Mean 5½*d.*	5*d.*—7*d.* Mean 6*d.*	75*s.*—80*s.* Mean 78*s.*
Col.	1	2	3	4	5	6	7

Note.—The total number of quarters of wheat sold in England and Wales for the 13 weeks ended September 30th, 1854, 733,059; for the 13 weeks ended December 31st, 1854, 1,674,173; for the 13 weeks ended March 31st, 1855, 1,143,999; for the 13 weeks ended June 30th, 1855, 1,232,284; for the 13 weeks ended September 30th, 1855, 1,229,082; for the 13 weeks ended December 31st, 1855, 1,649,610; for the 13 weeks ended March 31st, 1856, 1,197,970; for the 13 weeks ended June 30th, 1856, 1,364,370; and for the 13 weeks ended September 30th, 1856, 1,016,704. The total number of quarters entered for Home Consumption was, respectively, 625,755; 253,669; 439,676; 741,890; 669,639; 550,652; 624,233; 820,206; and 1,531,489.

still dear. Beef, at 5½*d.* per lb. by the carcase, is cheaper by 7 per cent. in the London markets than it was in 1855. Mutton has been 6*d.* per lb. during the three last summers; and in those seasons potatoes at the water-side market, Southwark, have differed little from 78*s.* a ton, or 2½ lbs. for 1*d.* wholesale.

State of the Public Health.—91,330 deaths were registered in the three months of July, August, and September; and the death-rate was 1·899 per cent. per annum, the average rate being 2·199. Out of the same population there were six instead of seven deaths.

49,982 deaths occurred in the districts comprising the chief towns, 41,348 in the districts comprising the small towns and the country districts. The annual rate of mortality in the summer was 2·282 per cent. in the towns, and 1·603 in the country; the average being 2·671 in the towns, and 1·814 in the country.

In no other country in Europe, it is believed, has the mortality of 9,680,592 of the population been so low as 16 in 1,000 during the last summer quarter.

Deaths in the Summer Quarters, 1846-56.

	1846	1847	1848	1849	1850	1851	1852	1853	1854	1855	Total 1846–55 (10 Yrs.)	1856
In 125 Districts and 23 Sub-districts, comprising the chief towns	55053	51764	45643	84443	45296	49113	54803	50153	67555	46942	550765	49982
In the remaining Districts and Sub-Districts of England and Wales, comprising chiefly small towns and country parishes ...	46611	41671	41995	50784	40553	42386	45579	42048	46288	40992	438907	41348
All England	101664	93435	87638	135227	85849	91499	100382	92201	113843	87934	989672	91330

Area, Population, Deaths, and Mortality per Cent. in the Summer Quarters, 1846-56.

	Area in Statute Acres.	Population Enumerated.		Deaths in 10 Summer Quarters, 1846–55.	Average Annual Rate of Mortality per Cent. of 10 Summer Quarters, 1846–55.	Annual Rate of Mortality per Cent. in the Summer Quarter 1856.
		June 6–7th, 1841.	March 31st, 1851.			
In 125 Districts, and 23 Sub-Districts, comprising the chief towns	2,149,800	6,838,069	8,247,017	550,765	2·671	2·282
In the remaining Districts and Sub-districts of England and Wales, comprising chiefly small towns and country parishes	35,175,115	9,076,079	9,680,592	438,907	1·814	1·603
All England	37,324,915	15,914,148	17,927,609	989,672	2·199	1·899

Meteorological Table, Quarter ended September 30th, 1856.

Names of Stations.	Mean Pressure of Dry Air reduced to the Level of the Sea.	Highest Reading of the Thermometer.	Lowest Reading of the Thermometer.	Range of Temperature in the Quarter.	Mean Monthly Range of Temperature.	Mean Daily Range of Temperature.	Mean Temperature of the Air.	Mean Degree of Humidity.	Wind.					Mean Amount of Cloud.	Rain.	
									Mean estimated Strength.	Relative Proportion of					Number of Days on which it fell.	Amount collected.
										N.	E.	S.	W.			
	in.	°	°	°	°	°	°									in.
Jersey	29·552	82·0	49·0	33·0	25·0	9·4	60·1	81	1·8	32	11	9	40	4·3	32	7·0
Falmouth	....	84·0	41·0	43·0	35·3	15·4	61·3	....	2·1	....	....	....	....	6·6	47	6·3
Truro	29·496	89·0	40·0	49·0	37·7	14·2	60·4	79	2·0	....	....	....	....	6·6	47	7·4
Teignmouth	29·526	79·6	40·7	38·9	32·2	15·5	59·9	78	0·5	21	40	51	68	5·4	38	6·4
Exeter	29·556	91·0	43·5	47·5	39·9	18·1	61·2	71	1·3	31	8	40	27	6·4	46	6·6
Newport	29·534	91·7	33·0	58·7	44·0	19·8	60·6	75	2·3	18	14	20	38	4·7	37	8·7
Clifton	29·504	91·4	34·7	56·7	41·7	16·1	58·6	84	1·1	36	17	31	57	5·1	44	11·6
Royal Observatory	29·519	89·8	40·0	49·8	40·3	20·0	59·9	77	....	14	14	22	33	6·6	40	5·8
Lambeth	29·354	89·2	39·8	49·4	41·3	20·3	64·1	82	0·6	42	29	32	81	4·0	30	6·2
Oxford	29·556	89·0	40·0	49·0	40·3	17·6	58·8	77	1·5	....	....	....	....	6·8	34	10·8
Hartwell Rectory	29·460	88·6	41·0	47·6	39·6	18·0	59·2	84	1·0	38	32	38	75	5·6	37	6·2
Royston	29·554	92·5	39·2	53·3	42·5	19·0	59·7	74	....	45	14	42	67	6·0	52	6·7
Lampeter	29·536	92·0	35·2	56·8	42·5	19·9	57·9	85	0·4	21	11	40	42	5·9	42	9·5
Norwich	29·452	85·0	40·0	45·0	33·8	16·8	60·4	82	1·5	....	....	....	....	5·8	39	8·9
Derby	29·463	86·0	37·0	49·0	39·0	18·1	59·2	72	....	....	....	....	....	....	47	9·8
Holkham	29·501	84·0	41·3	42·7	35·6	16·1	58·8	78	1·5	20	15	30	27	5·8	39	8·6
Nottingham	29·528	92·5	36·3	56·2	44·3	19·9	56·4	79	0·4	....	....	....	....	6·7	50	9·2
Hawarden	29·509	84·5	43·0	41·5	30·7	11·7	58·1	82	1·7	....	....	....	....	7·0	45	9·5
Liverpool	29·537	85·9	46·9	39·0	27·7	11·3	59·4	76	0·9	....	....	....	....	7·1	44	8·1
Manchester	29·474	92·5	34·5	58·0	44·8	20·8	58·7	80	....	12	3	16	30	6·2	47	7·1
Wakefield	29·536	88·2	35·0	53·2	44·1	19·0	57·6	81	1·6	67	52	82	162	6·6	50	13·0
York	29·534	81·0	35·5	45·5	33·8	14·0	55·9	84	....	....	....	....	....	....	41	9·5
Scarborough	29·384	75·1	41·0	34·1	26·4	9·7	55·8	84	2·3	32	33	55	63	....	32	9·0
Durham	29·511	80·1	38·8	41·3	54·0	13·0	54·1	85	1·1	....	....	....	....	7·5	40	10·9
Allenheads	29·608	81·7	37·2	44·5	35·7	13·9	52·1	84	2·0	35	34	23	92	5·2	67	15·1

REVENUE.

An Abstract of the Net Produce of the Revenue of the United Kingdom *in the Years and Quarters ended 30th September,* 1855 *and* 1856; *showing the Increase and Decrease thereof.*—(*Continued from page* 300.)

Sources of Revenue.	Years ended 30th September.			
	1855.	1856.	Increase.	Decrease.
	£	£	£	£
Customs	22,842,443	23,093,301	250,858	....
Excise	17,388,170	17,861,778	473,608	....
Stamps	7,259,565	7,180,041	....	79,524
Taxes	3,060,499	3,100,026	39,527	....
Property Tax	13,665,205	15,940,331	2,275,126	....
Post Office	2,709,094	2,768,152	59,058	....
Crown Lands	275,516	288,857	8,341	....
Miscellaneous	935,867	1,120,581	184,714	....
Totals	68,136,359	71,348,067	3,291,232	79,524
			Net Increase	£3,211,708

Sources of Revenue.	Quarters ended 30th September.			
	1855.	1856.	Increase.	Decrease.
	£	£	£	£
Customs	6,018,487	5,981,344	....	37,143
Excise	5,137,000	5,446,000	309,000	....
Stamps	1,652,723	1,770,649	117,926	....
Taxes	154,000	157,000	3,000	....
Property Tax	4,594,858	5,347,236	752,378	....
Post Office	645,000	645,000	....	....
Crown Lands	66,516	67,857	1,341	....
Miscellaneous	188,557	156,343	....	32,214
Totals	18,457,141	19,571,429	1,183,645	69,357
			Net Increase	£1,114,288

An Account showing the Revenue and other Receipts of the Quarter ended the 30th of September, 1856; the Application of the same, and the Charge of the Consolidated Fund for the said Quarter, together with the Surplus or Deficiency upon such Charge.

	£	£
Surplus balance beyond the charge of the Consolidated Fund, for the quarter ended June 30th, 1856, viz.:—		
Great Britain		
Ireland £339,581		
		339,581
Income received in the quarter ended September 30th, 1856, as shown in page 396		19,571,429
Amount received in the quarter ended September 30th, 1856, in full of Second Loan of £5,000,000		2,500,000
Amount received in the quarter ended September 30th, 1856, in repayment of advances for Public Works, &c.		441,754
		22,852,764
Balance, being the deficiency on the 30th September, 1856, upon the charge of the Consolidated Fund in Great Britain, to meet the Dividends and other Charges payable in the quarter to December 31st, 1856, and for which Exchequer Bills (Deficiency) will be issued in that quarter		500,333
		£23,353,097

	£	£
Amount applied out of the income for the quarter ended September 30th, 1856, to redemption of Exchequer Bills (Deficiency) for the quarter ended June 30th, 1856		3,584,645
Amount applied out of the Income to supply services, in the quarter ended September 30th, 1856		11,229,963
Charge of the Consolidated Fund for the quarter ended September 30th, 1856, viz.:—		
Interest of the Permanent Debt	£5,550,977	
Terminable Debt	1,430,064	
Interest of Exchequer-Bills (Deficiency)	5,544	
The Civil List	100,152	
Other Charges on Consolidated Fund	319,424	
Advances for Public Works, &c.....	352,450	
Sardinian Loan	500,000	
		8,258,611
Surplus Balance beyond the charge of the Consolidated Fund, for the quarter ended Sept. 30th, 1856, viz.:—		
Great Britain		
Ireland	279,878	
		279,878
		£23,353,097

CORN.

Average Prices of Corn per Imperial Quarter in England and Wales, during each Week of the Third Quarter of 1856; *together with the Monthly and Quarterly Average.*—(*Continued from p.* 302.)

[Communicated by H. F. Jadis, Esq., Comptroller of Corn Returns.]

Weeks ended on a Saturday, 1856.	Weekly Average.											
	Wheat.		Barley.		Oats.		Rye.		Beans.		Peas.	
	s.	*d.*	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*
July 5	74	7	39	7	26	1	48	11	44	5	43	0
„ 12	76	3	40	2	24	11	49	11	45	5	43	7
„ 19	76	3	40	4	26	11	52	0	46	0	43	9
„ 26	77	5	41	8	27	2	47	5	45	4	43	2
Average for July	76	1	40	5	26	3	49	6	45	3	43	1
August 2	77	10	42	7	27	9	48	4	45	7	43	8
„ 9	76	0	43	3	27	1	46	4	45	9	42	10
„ 16	71	0	43	7	26	3	43	3	44	4	39	0
„ 23	68	9	44	7	27	11	43	8	44	8	38	11
„ 30	70	8	45	1	27	0	44	1	45	4	39	11
Average for August	72	10	43	9	27	2	45	4	45	1	40	10
September 6	73	2	47	6	27	4	43	1	45	5	40	9
„ 13	69	6	46	8	25	10	43	9	45	4	41	0
„ 20	64	5	45	10	27	2	44	10	46	3	41	9
„ 27	64	4	43	10	26	7	43	8	45	0	43	8
Average for September	67	10	45	11	26	8	43	10	45	6	41	9
Average for the Quarter ..	72	3	43	5	26	9	46	2	45	3	41	10

STOCKS AND SHARES.

Fluctuations in the Stock and Share Markets during the Months of July, August, and September, 1856.—(*Continued from p.* 302.)

Stocks and Shares.	Amt. of Share.	Amt. Paid.	Price on the			Highest Price during the Months of			Lowest Price during the Months of		
			1 July	1 Aug.	1 Sept.	July.	Aug.	Sept.	July.	Aug.	Sept.
Consols	...	...	95½	95⅝	95⅛	96	95⅞	95¼	95⅜	94⅞	91¾
Exchequer Bills	...	...	12*s.* to 15*s.* Pm.	14*s.* to 18*s.* Pm.	12*s.* to 15*s.* Pm.	24*s.* Pm.	20*s.* Pm.	17*s.* Pm.	12*s.* Pm.	8*s.* Pm.	7*s.* Pm.
RAILWAYS.											
Brighton	Stock	100	109½	107½	107	110¼	108	107	108	105	104
Caledonian	„	100	63¾	60½	51¾	63¾	61	55½	60¼	51¾	51¼
Eastern Counties	„	20	11⅛	10⅜	9½	11¼	10⅜	9⅝	10⅛	9½	8⅝
Great Northern	„	100	97½	95	96¼	98	96½	96½	94	94	91½
Great Western	„	100	64	62½	64¾	64	65	65½	60¾	61¾	62⅛
London & North-Western	„	100	108¼	105½	104¾	110	105½	105	107¼	104½	101½
Midland	„	100	85	82½	81¾	85¼	83½	82	82	81½	76¼
Lancashire and Yorkshire	„	100	99	98	96	99	98¾	98	97¼	97½	93½
North Staffordshire	20	17½	12⅛	12⅞	12⅝	13½	13⅛	12⅝	12⅛	12⅝	11¾
South-Eastern	Stock	100	77	74½	73	77¼	75½	73	73½	73⅝	68⅝
South-Western	„	100	107½	107¾	106¾	109½	107¾	107	106	106	102
York, Newcastle, & Berwick	„	100	89	85½	82	90	85½	82½	86½	81	77
York and North Midland..	„	100	63½	61¼	58	65	61¼	59	62	57¾	54
Northern of France	20	16	45¼	41⅓	41	45¾	42⅛	41¼	44	41	37
East Indian	20	20	24½	23⅜	23¼	25	23½	23¼	24¼	22⅜	21¾

CURRENCY.

Bank of England.

An Account, pursuant to the Act 7th and 8th Victoria, c. 32, for each Week ended on a Saturday, for the Third Quarter of 1856.—(*Continued from p.* 303.)

[Compiled from the "Bankers' Magazine."]

ISSUE DEPARTMENT.

Date.	Notes Issued.	Notes in hands of Public.	Government Debt.	Other Securities.	Gold Coin and Bullion.	Silver Bullion.
1856.	£	£	£	£	£	£
July 5 ...	26,499,365	19,946,645	11,015,100	3,459,900	12,024,365	...
,, 12 ...	26,273,605	20,838,885	11,015,100	3,459,900	11,798,605	...
,, 19 ...	26,183,930	20,862,630	11,015,100	3,459,900	11,708,930	...
,, 26 ...	26,250,875	20,447,830	11,015,100	3,459,900	11,775,875	...
Aug. 2 ...	26,271,095	20,476,440	11,015,100	3,459,900	11,726,095	...
,, 9 ...	26,307,590	20,112,590	11,015,100	3,459,900	11,832,590	...
,, 16 ...	26,279,730	20,079,170	11,015,100	3,459,900	11,804,730	...
,, 23 ...	26,226,795	19,939,145	11,015,100	3,459,900	11,751,795	...
,, 30 ...	26,188,315	20,124,595	11,015,100	3,459,900	11,713,315	...
Sept. 6 ...	26,001,765	19,980,105	11,015,100	3,459,900	11,526,765	...
,, 13 ...	25,962,415	19,751,690	11,015,100	3,459,900	11,487,415	...
,, 20 ...	26,015,080	19,789,185	11,015,100	3,459,900	11,540,080	...
,, 27 ...	25,603,940	20,224,230	11,015,100	3,459,900	11,128,940	...

BANKING DEPARTMENT.

Date.	Proprietors' Capital.	Rest.	Public Deposits.	Other Deposits.	Seven Day and other Bills.	Total Dr.
1856.	£	£	£	£	£	£
July 5 ...	14,553,000	3,284,962	4,817,074	10,470,957	849,731	33,975,724
,, 12 ...	14,553,000	3,320,522	2,547,500	12,698,812	876,690	33,996,534
,, 19 ..	14,553,000	3,347,460	3,242,869	11,902,473	849,451	33,895,253
,, 26 ..	14,553,000	3,351,951	3,844,808	10,598,296	875,807	33,223,862
Aug. 2 ...	14,553,000	3,364,781	3,677,416	10,581,413	923,865	33,100,475
,, 9 ...	14,553,000	3,456,786	4,285,108	10,153,804	897,663	33,346,361
,, 16 ...	14,553,000	3,458,690	4,668,218	10,560,407	891,412	34,131,727
,, 23 ...	14,553,000	3,416,323	4,721,846	10,021,829	882,965	33,595,963
,, 30 ...	14,553,000	3,688,406	5,590,339	9,734,553	930,444	34,496,742
Sept. 6 ...	14,553,000	3,717,742	6,087,068	9,624,407	932,474	34,914,691
,, 13 ...	14,553,000	3,730,817	6,609,292	9,973,564	887,179	35,753,852
,, 20 ...	14,553,000	3,743 895	7,909,724	9,958,972	969,336	37,074,927
,, 27 ...	14,553,000	3,754,416	8,409,851	9,956,813	927,399	37,601,479

Date.	Government Securities.	Other Securities.	Notes.	Gold and Silver Coin.	Total Cr.
1856.	£	£	£	£	£
July 5 ...	11,308,515	15,527,912	6,552,720	586,577	33,975,724
,, 12 ...	14,208,464	13,773,626	5,434,720	579,724	33,996,534
,, 19 ...	14,796,464	13,153,664	5,321,300	621,825	33,895,253
,, 26 ...	13,713,464	13,094,424	5,803,045	612,929	33,223,862
Aug. 2 ...	12,483,045	14,186,000	5,794,655	636,775	33,100,475
,, 9 ...	12,010,078	14,478,928	6,195,000	662,355	33,346,361
,, 16 ...	12,010,078	15,270,195	6,200,560	650,894	34,131,727
,, 23 ...	12,062,022	14,562,330	6,287,650	683,961	33,595,963
,, 30 ...	12,114,078	15,645,153	6,663,720	673,792	34,496,742
Sept. 6 ...	12,114,078	16,126,951	6,021,660	652,002	34,914,691
,, 13 ...	11,964,953	16,924,279	6,210,725	653,895	35,753,852
,, 20 ...	11,964,953	18,291,557	6,225,895	592,522	37,074,927
,, 27 ...	11,964,953	19,616,384	5,379,710	640,432	37,601,479

CURRENCY.—*Continued.*

Country Banks.

Average amount of Promissory Notes in Circulation in England and Wales in each Week ended on a Saturday, for the Third Quarter of 1856.—(*Continued from page* 304.)

[Compiled from the "Bankers' Magazine."]

England and Wales.

Date.	Private Banks.	Joint Stock Banks.	Total.
1856.	£	£	£
July 5	3,776,540	3,051,498	6,828,038
,, 12	3,815,848	3,083,662	6,899,510
,, 19	3,772,678	3,926,931	6,799,609
,, 26	3,704,709	2,950,544	6,655,253
Aug. 2	3,641,785	2,901,720	6,543,505
,, 9	3,602,190	2,893,326	6,495,516
,, 16	3,560,632	2,903,014	6,463,646
,, 23	3,544,815	2,937,005	6,481,820
,, 30	3,538,899	2,941,761	6,480,660
Sept. 6	3,570,853	2,964,652	6,535,505
,, 13	3,625,116	3,025,636	6,650,752
,, 20	3,692,291	3,097,241	6,789,532
,, 27	3,790,410	3,104,275	6,894,685

Fixed Issues—Private Banks, £4,570,931; Joint Stock Banks, £3,303,357.

Average amount of Promissory Notes in Circulation in Scotland and Ireland during the Four Weeks ended the 5th of July, the 2nd and 30th of August, and the 27th of September, 1856.—(*Continued from page* 304.)

Scotland.

Date.	£5 and upwards.	Under £5.	Total.
1856.	£	£	£
July 5	1,499,607	2,633,499	4,133,110
Aug. 2	1,411,265	2,594,213	4,005,484
,, 30	1,360,997	2,580,448	3,941,450
Sept. 27	1,375,453	2,627,208	4,002,666

Ireland.

Date.	£5 and upwards.	Under £5.	Total.
1856.	£	£	£
July 5	3,149,120	3,030,031	6,179,154
Aug. 2	3,111,353	3,020,699	6,132,055
,, 30	3,042,626	2,999,199	6,041,828
Sept. 27	3,131,679	3,255,028	6,386,711

Fixed Issues—Scotland, £3,087,209; Ireland, £6,354,494.

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